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(54) **SLIDE RAIL ASSEMBLY**

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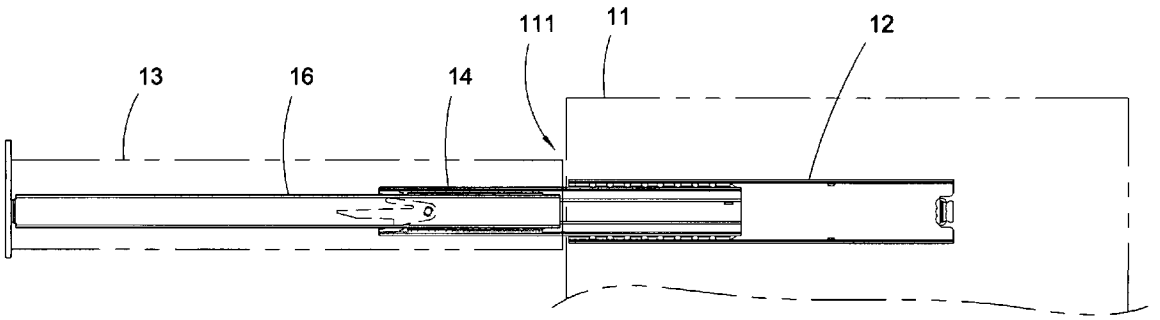
(57) **ABSTRACT**

A slide rail assembly includes an outer slide rail having a certain length, a middle slide rail having a certain length and reciprocally slidably nested in the outer slide rail and an inner slide rail having a certain length and reciprocally slidably nested in the middle slide rail. When the inner slide rail is pushed to drive the middle slide rail to together get into the outer slide rail by a maximum travel, an inner end of the inner slide rail protrudes from an inner end of the middle slide rail and an inner end of the outer slide rail. Also, the inner end of the middle slide rail protrudes from the inner end of the outer slide rail.



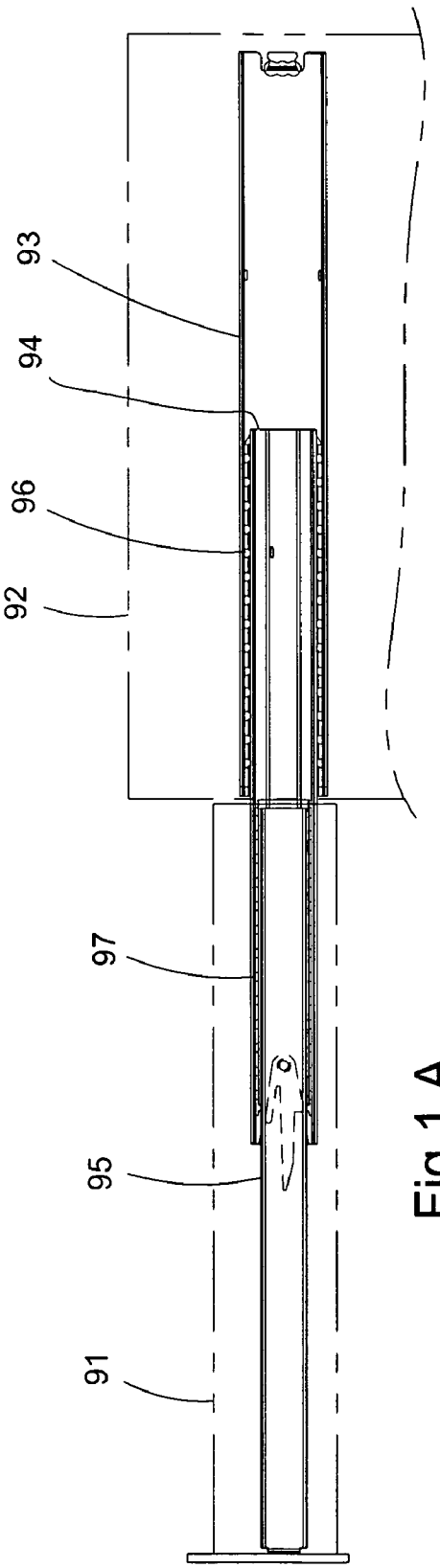


Fig.1 A
PRIOR ART

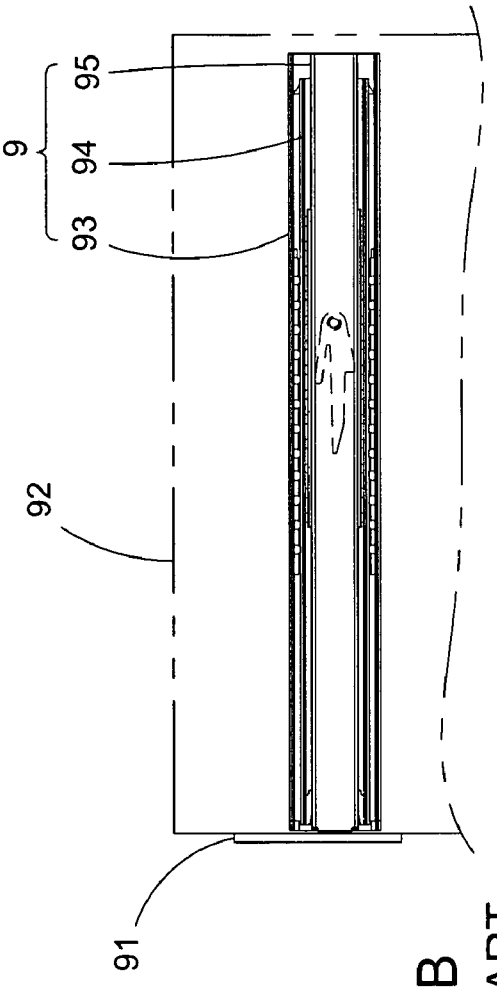


Fig.1 B
PRIOR ART

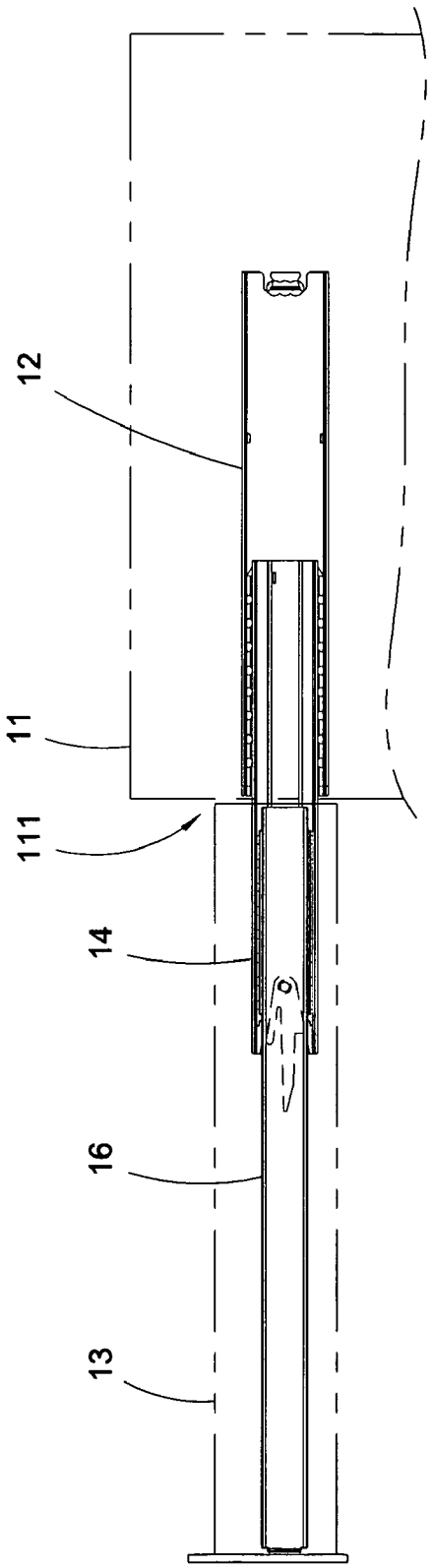


Fig.2 A

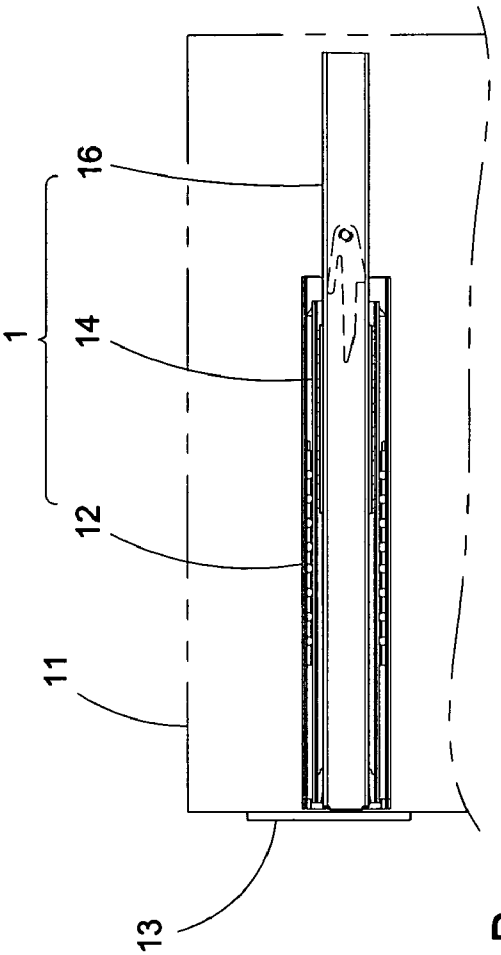


Fig.2 B

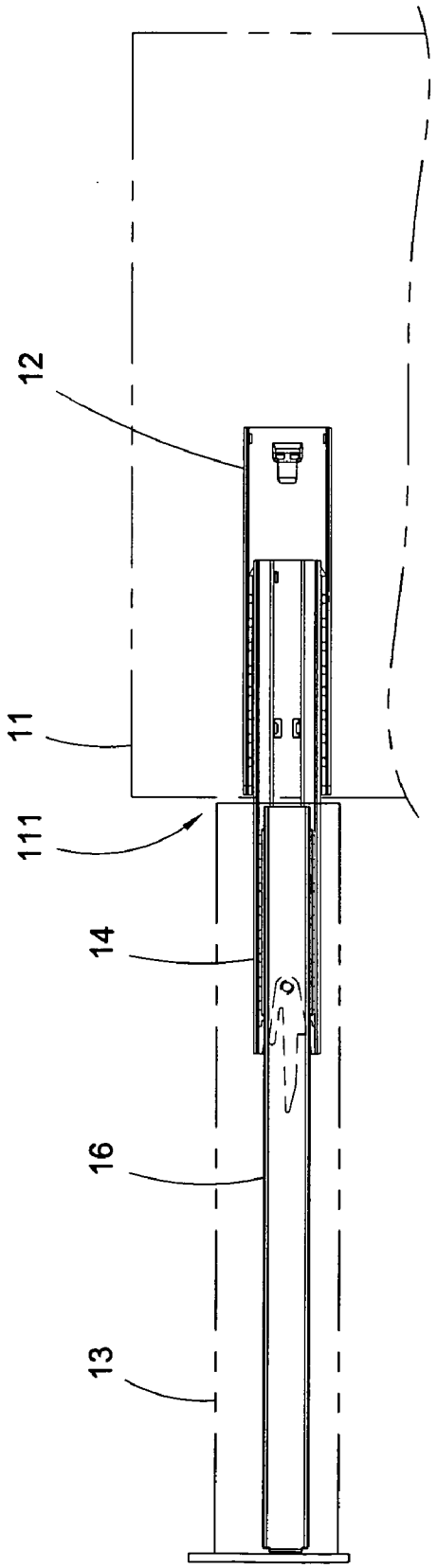


Fig.3 A

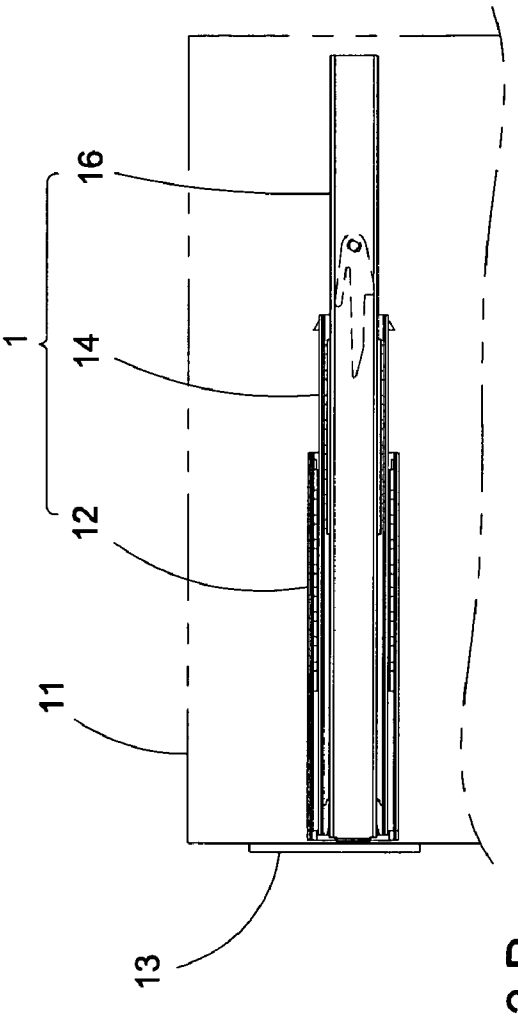


Fig.3 B

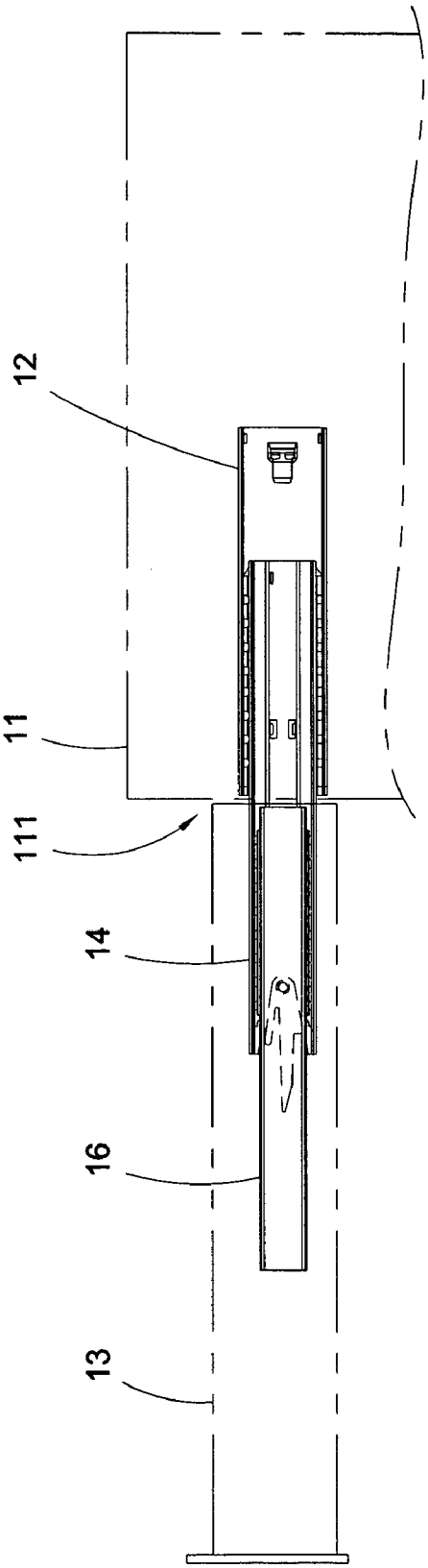


Fig.4 A

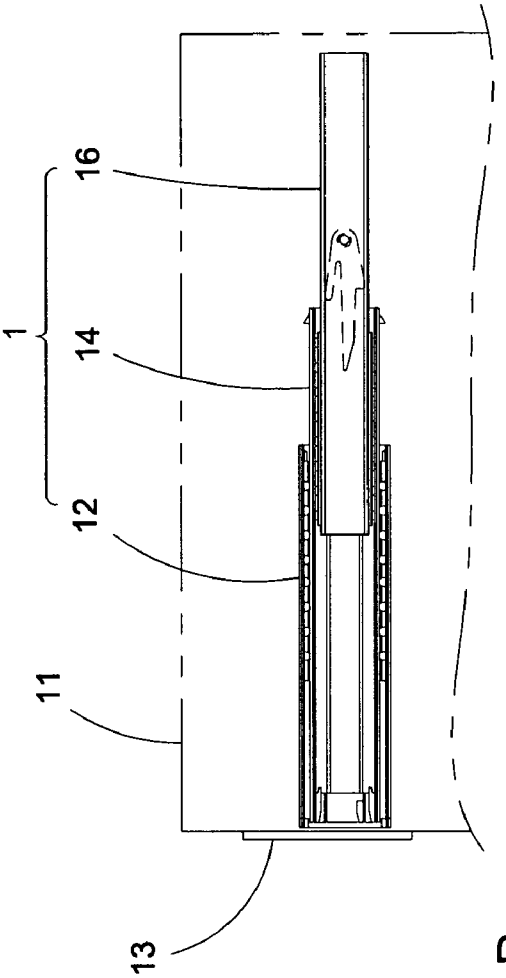


Fig.4 B

SLIDE RAIL ASSEMBLY

BACKGROUND OF THE INVENTION

[0001] The present invention is related to a slide rail structure, and more particularly to a slide rail assembly of a tool cabinet or a file cabinet equipped with several drawers.

[0002] A conventional tool cabinet or a file cabinet is generally equipped with several drawers arranged in the cabinet body. Corresponding rails are respectively mounted on the drawers and the cabinet body. The rails are relatively slidably fitted with each other, whereby the drawers can be drawn out of and pushed into the cabinet body.

[0003] FIGS. **1**A and **1**B show a conventional drawer **91** designed with an elongated length for enlarging capacity. Three rails, that is, a cabinet slide rail **93**, a middle slide rail **94** and a drawer slide rail **95** are provided for fully or principally drawing the drawer **91** out of the cabinet body **92** without derailing. These slide rails are slidably assembled with each other and formed a slide rail assembly **9**, whereby the drawer **91** can be totally drawn out of the cabinet body **92** without derailing and dropping from the cabinet body **92**. Ball bearings **96**, **97** are arranged between the slide rails to reduce the frictional force therebetween. Therefore, the slide rails can be easily slid without causing noise.

[0004] In general, the cabinet slide rail **93**, middle slide rail **94** and drawer slide rail **95** substantially have nearly equal lengths. The length of the middle slide rail **94** is slightly shorter than those of the cabinet slide rail **93** and the drawer slide rail **95**. When the drawer slide rail **95** drives the middle slide rail **94** to be totally pushed into the cabinet slide rail **93**, the drawer slide rail **95** and the middle slide rail **94** are nested in the cabinet slide rail **93**. On the basis of length of material, these slide rails are all about the same length of material. In addition, the drawer **91** and the cabinet body **92** can get and apply to the slide rail assembly of the different manufacturer. Basically, only these slide rail assemblies have the same length when the drawer slide rail **95** drives the middle slide rail **94** to be totally pushed into the cabinet slide rail **93**. In other words, the minimum lengths of these slide rail assemblies are the same.

SUMMARY OF THE INVENTION

[0005] It is therefore a primary object of the present invention to provide a slide rail assembly. While maintaining load capacity of the slide rail assembly, the length of the slide rail assembly is shortened to lower material cost. Also, a drawer equipped with such slide rail assembly can be still fully pushed into and drawn out of a cabinet body.

[0006] According to the above object, the slide rail assembly of the present invention includes an outer slide rail, a middle slide rail and an inner slide rail. The outer slide rail has a certain length. One side of the outer slide rail is fixable on an inner face of a main body having an opening. The middle slide rail has a certain length and reciprocally slidably nested in the outer slide rail. The inner slide rail has a certain length and reciprocally slidably nested in the middle slide rail. One side of the inner slide rail is connectable with an article, whereby the article can be drawn out of or pushed into the main body through the opening thereof. When the inner slide rail is pushed to drive the middle slide rail to together get into the outer slide rail by a maximum travel, an inner end of the inner slide rail protrudes from an inner end of the middle slide rail and an inner end of the outer slide rail. Also, the inner end of the middle slide rail protrudes from the inner end of the outer slide rail.

[0007] The present invention can be best understood through the following description and accompanying drawings wherein:

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] FIG. **1**A is a side view of a conventional slide rail assembly, in which the drawer slide rail is drawn out by a maximum travel;

[0009] FIG. **1**B is a side view of the conventional slide rail assembly according to FIG. **1**A, in which the drawer slide rail is pushed in by a maximum travel;

[0010] FIG. **2**A is a side view of a first embodiment of the slide rail assembly of the present invention, in which the inner slide rail is drawn out by a maximum travel;

[0011] FIG. **2**B is a side view of the first embodiment of the slide rail assembly of the present invention according to FIG. **2**A, in which the inner slide rail is pushed in by a maximum travel;

[0012] FIG. **3**A is a side view of a second embodiment of the slide rail assembly of the present invention, in which the inner slide rail is drawn out by a maximum travel;

[0013] FIG. **3**B is a side view of the second embodiment of the slide rail assembly of the present invention according to FIG. **3**A, in which the inner slide rail is pushed in by a maximum travel;

[0014] FIG. **4**A is a side view of a third embodiment of the slide rail assembly of the present invention, in which the inner slide rail is drawn out by a maximum travel;

[0015] FIG. **4**B is a side view of the third embodiment of the slide rail assembly of the present invention according to FIG. **4**A, in which the inner slide rail is pushed in by a maximum travel.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0016] Please refer to FIGS. **2**A and **2**B. According to a first embodiment, the slide rail assembly **1** of the present invention includes an outer slide rail **12**, a middle slide rail **14** and an inner slide rail **16**.

[0017] The outer slide rail **12** has a certain length. A front end and a rear end of one side of the outer slide rail **12** are lengthwise fixed on an inner face of a main body **11** such as a cabinet body. The main body **11** has an opening **111**.

[0018] The middle slide rail **14** has a certain length and is lengthwise reciprocally slidably nested in the outer slide rail **12**.

[0019] The inner slide rail **16** has a certain length and is lengthwise reciprocally slidably nested in the middle slide rail **14**. One side of the inner slide rail **16** is connected with an article **13** such as a drawer. Accordingly, the article **13** can be drawn out of or pushed into the main body **11** through the opening **111** thereof.

[0020] Wherein the slide rail assembly **1** is telescopic and has a maximum length and a minimum length.

[0021] When the inner slide rail **16** is pushed to drive the middle slide rail **14** to together get into the outer slide rail **12** by a maximum travel, the outer ends of the inner slide rail **16** and the middle slide rail **14** are retracted into the outer slide rail **12**. At this time, the inner end of the inner slide rail **16** protrudes from the inner end of the outer slide rail **12**.

[0022] In comparison with the conventional slide rail assembly, in the first embodiment of the present invention, the lengths of the outer slide rail **12** and middle slide rail **14** are shortened. When the inner slide rail **16** drives the middle slide rail **14** to together get into the outer slide rail **12** by a maximum travel, the middle slide rail **14** is kept received in the outer slide rail **12**, the partial inner slide rail **16** is received in the outer slide rail **12** and the another partial inner slide rail **16** protrudes from the inner end of the outer slide rail **12**. The minimum length of the slide rail assembly of the present invention is still equal to that of the correspondingly conventional slide rail assembly so as to achieve telescopic function as the conventional one. The inner slide rail **16** of the present invention is like a cantilever and can bear the loading ability as the conventional one does. However, the cost for the material of the slide rail assembly of the present invention is lowered.

[0023] In the first embodiment (FIGS. **2**A and **2**B), when the inner slide rail **16** drives the middle slide rail **14** to together get into the outer slide rail **12** by a maximum travel (FIG. **2**B), the inner end of the inner slide rail **16** protrudes from the inner end of the outer slide rail **12** by a first distance and the length of the slide rail assembly is a second distance. The first distance is longer than a tenth of the second distance. In other words, the first distance is longer than a tenth of the minimum length of the slide rail assembly **1**.

[0024] Ball bearings are arranged between the outer slide rail **12**, the middle slide rail **14** and the inner slide rail **16** to reduce the frictional force therebetween. Therefore, the slide rails can be easily slid without causing noise.

[0025] FIGS. **3**A and **3**B show a second embodiment of the present invention, which is evolved from the first embodiment. However, the outer slide rail **12** of the second embodiment is shorter than the outer slide rail **12** of the first embodiment. In other words, when the inner slide rail **16** drives the middle slide rail **14** to together get into the outer slide rail **12** by a maximum travel (FIG. **3**B), the outer ends of the inner slide rail **16** and the middle slide rail **14** are retracted into the outer slide rail **12**. At this time, the inner end of the middle slide rail **14** protrudes from the inner end of the outer slide rail **12**, the inner end of the inner slide rail **16** protrudes from the inner end of the middle slide rail **14**, the length of the slide rail assembly of the second embodiment is equal to that of the slide rail assembly of the first embodiment and it is unnecessary that the first distance is longer than a tenth of the second distance.

[0026] In the second embodiment of the present invention, the length of the inner slide rail **16** is longer than that of the middle slide rail **14**, while the length of the middle slide rail **14** is longer than that of the outer slide rail **12**.

[0027] FIGS. **4**A and **4**B show a third embodiment of the present invention, which is based on the second embodiment. However, the inner slide rail **16** of the third embodiment is shorter than the inner slide rail **16** of the second embodiment. In other words, the inner slide rail **16** of the third embodiment is shortened from the outer end of the inner slide rail **16** of the second embodiment. This can further lower the cost for the material.

[0028] The concept of the present invention consists in shortening the lengths of the outer slide rail **12** and middle slide rail **14** from its inner end but maintaining the length of the inner slide rail **16**, further shortening the length of the outer slide rail **12** and furthermore shortening the length of the inner slide rail **16** from its outer end in order to lower the cost for the material.

[0029] The above embodiments are only used to illustrate the present invention, not intended to limit the scope thereof. Many modifications of the above embodiments can be made without departing from the spirit of the present invention.

What is claimed is:

1. A slide rail assembly comprising:
an outer slide rail having a certain length, one side of the outer slide rail being fixable on an inner face of a main body having an opening;
a middle slide rail having a certain length and reciprocally slidably nested in the outer slide rail; and
an inner slide rail having a certain length and reciprocally slidably nested in the middle slide rail, one side of the inner slide rail being connectable with an article, whereby the article can be moved in and out the main body through the opening thereof, wherein said slide rail assembly is telescopic and has a maximum length and a minimum length, said slide rail assembly being characterized in when the inner slide rail is pushed to drive the middle slide rail to together get into the outer slide rail by a maximum travel, two ends of the middle slide rail are positioned in the outer slide rail without protruding from two ends of the outer slide rail, while the inner end of the inner slide rail protrudes from the inner end of the outer slide rail by a first distance, the first distance is longer than a tenth of the minimum length of said slide rail assembly.

2. A slide rail assembly comprising:
an outer slide rail having a certain length, one side of the outer slide rail being fixable on an inner face of a main body having an opening;
a middle slide rail having a certain length and reciprocally slidably nested in the outer slide rail; and
an inner slide rail having a certain length and reciprocally slidably nested in the middle slide rail, one side of the inner slide rail being connectable with an article, whereby the article can be moved in and out the main body through the opening thereof, said slide rail assembly being characterized in that when the inner slide rail is pushed to drive the middle slide rail to together get into the outer slide rail by a maximum travel, an outer end of the inner slide rail and an outer end of the middle slide rail are retracted into the outer slide rail, an inner end of the middle slide rail protrudes from the inner end of the outer slide rail and the inner end of the inner slide rail protrudes from the inner end of the middle slide rail.

3. The slide rail assembly as claimed in claim **2**, wherein the length of the inner slide rail is longer than the length of the middle slide rail, while the length of the middle slide rail is longer than the length of the outer slide rail.

4. The slide rail assembly as claimed in claim **2**, wherein the length of the middle slide rail is longer than the length of the outer slide rail, while the length of the inner slide rail is between the length of the middle slide rail and the length of the outer slide rail.

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