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(54) **SHIELDING DEVICE FOR VEHICLE WHILE OPENING THE DOOR**

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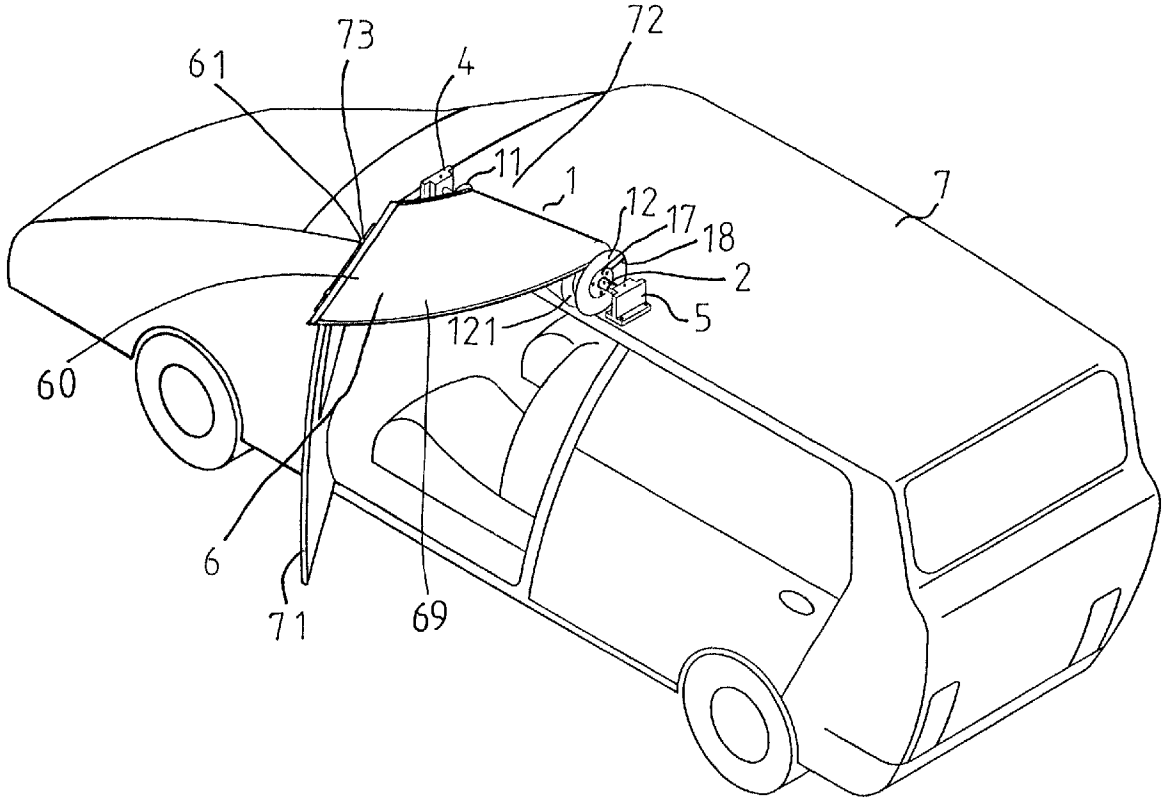
(52) **U.S. Cl.** **135/88.07**

(57) **ABSTRACT**

A shielding device for shielding a space between a door and an object when the door is opened, includes two seats, a spool rotatably secured between the seats with a shaft and having a frustum shape, and a sector shield having one side edge secured to the spool and to be wound onto or unwound from the spool when the spool is rotated around the shaft. The seats and the other side edge of the shield are secured to the object and the door respectively for allowing the shield to be unwound from the spool to shield the space between the door and the object when the door is opened.



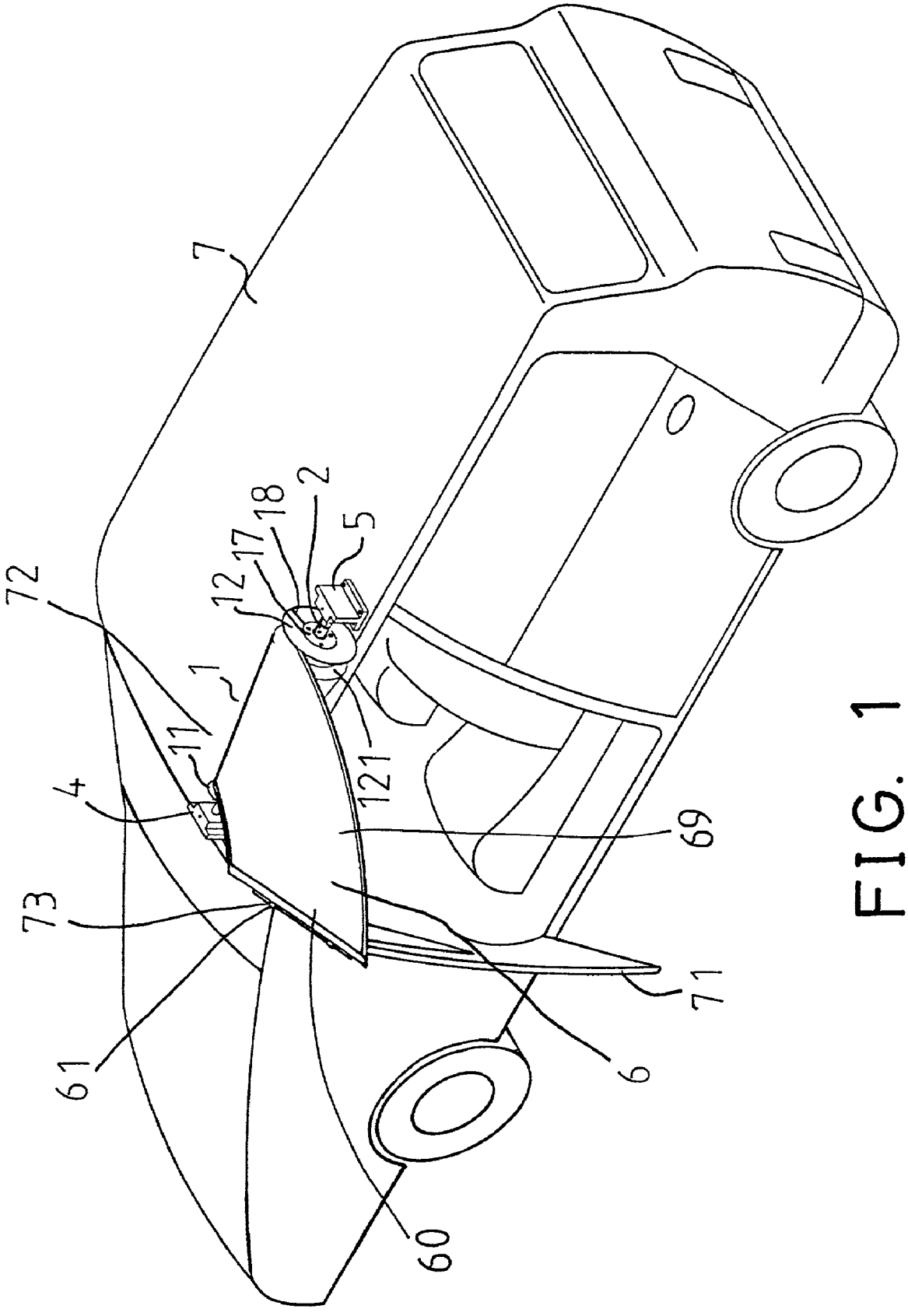


FIG. 1

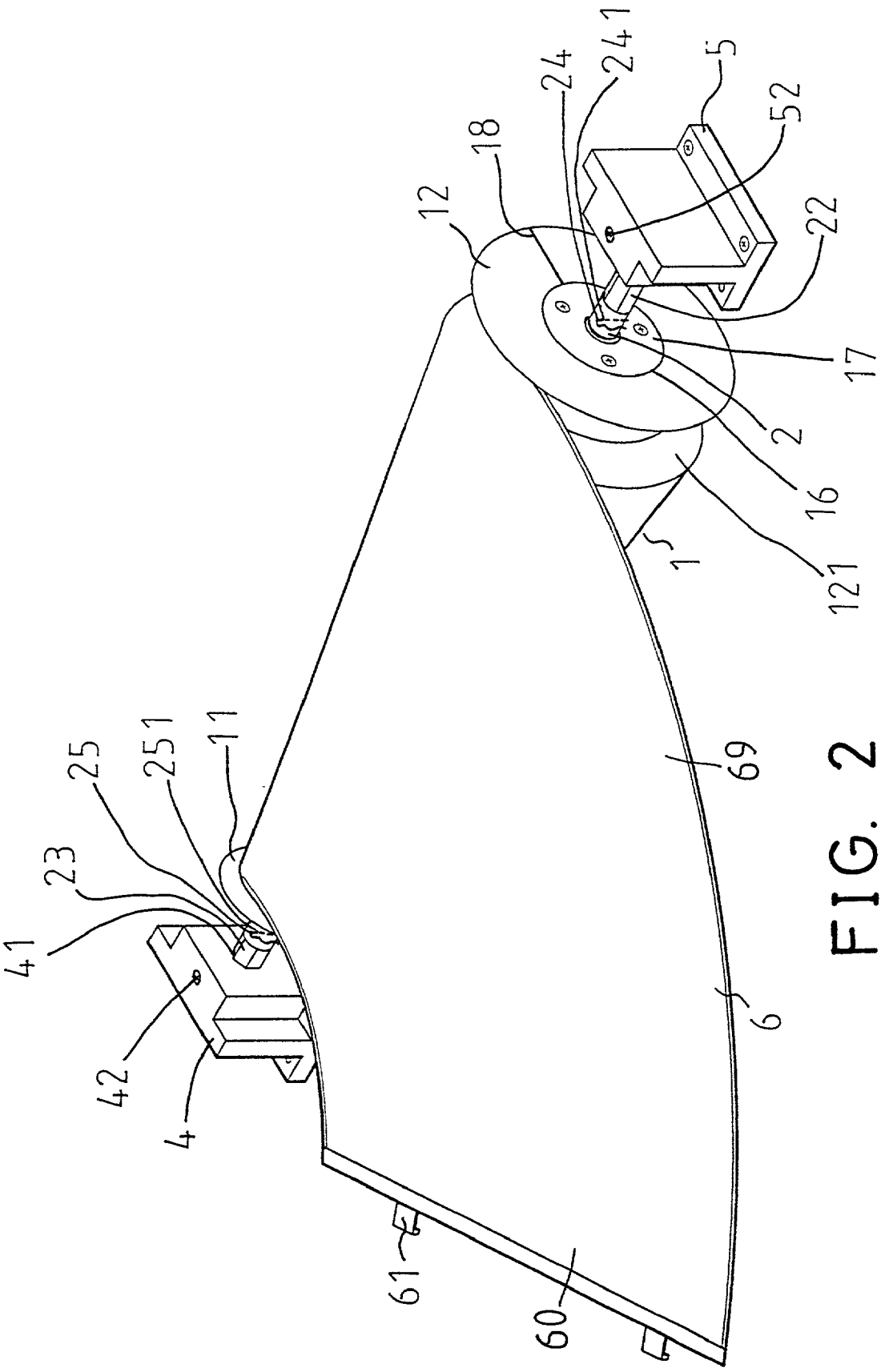


FIG. 2

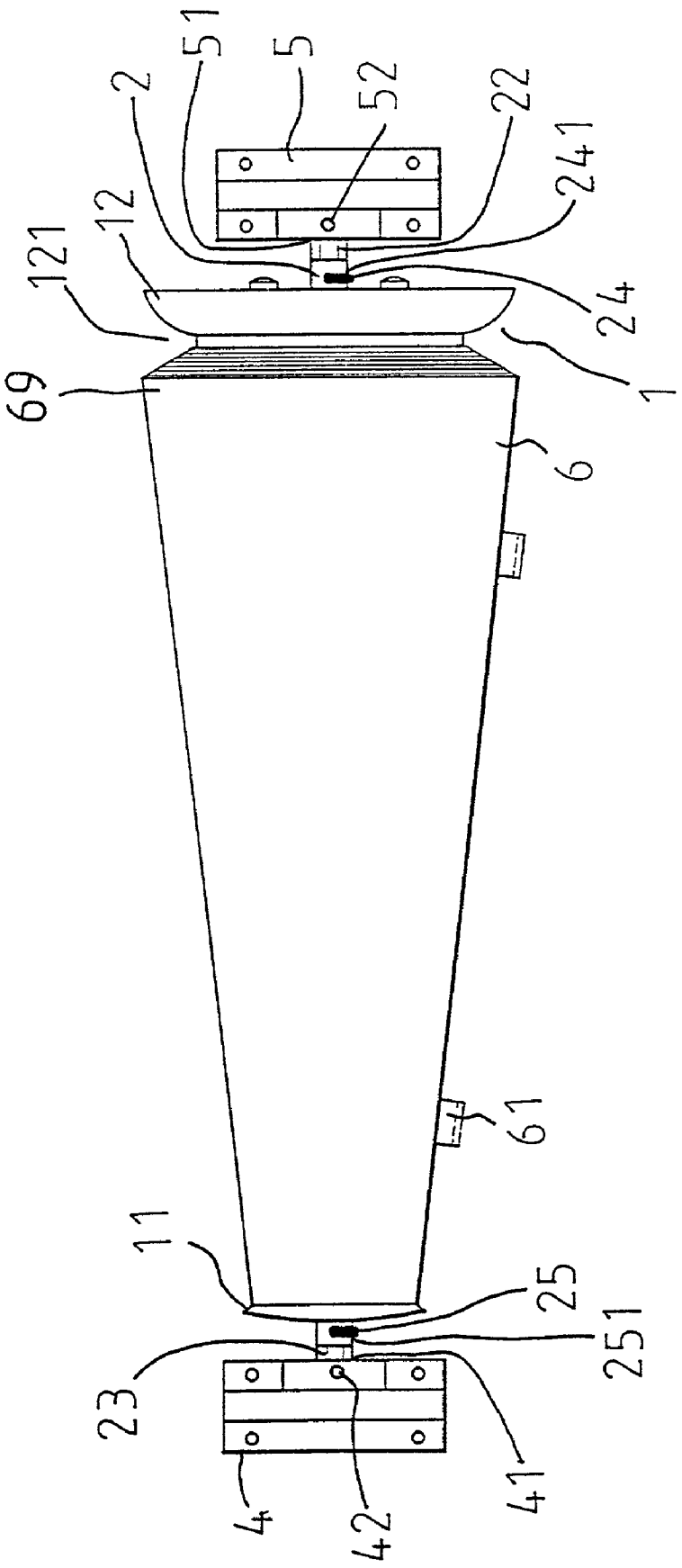


FIG. 3

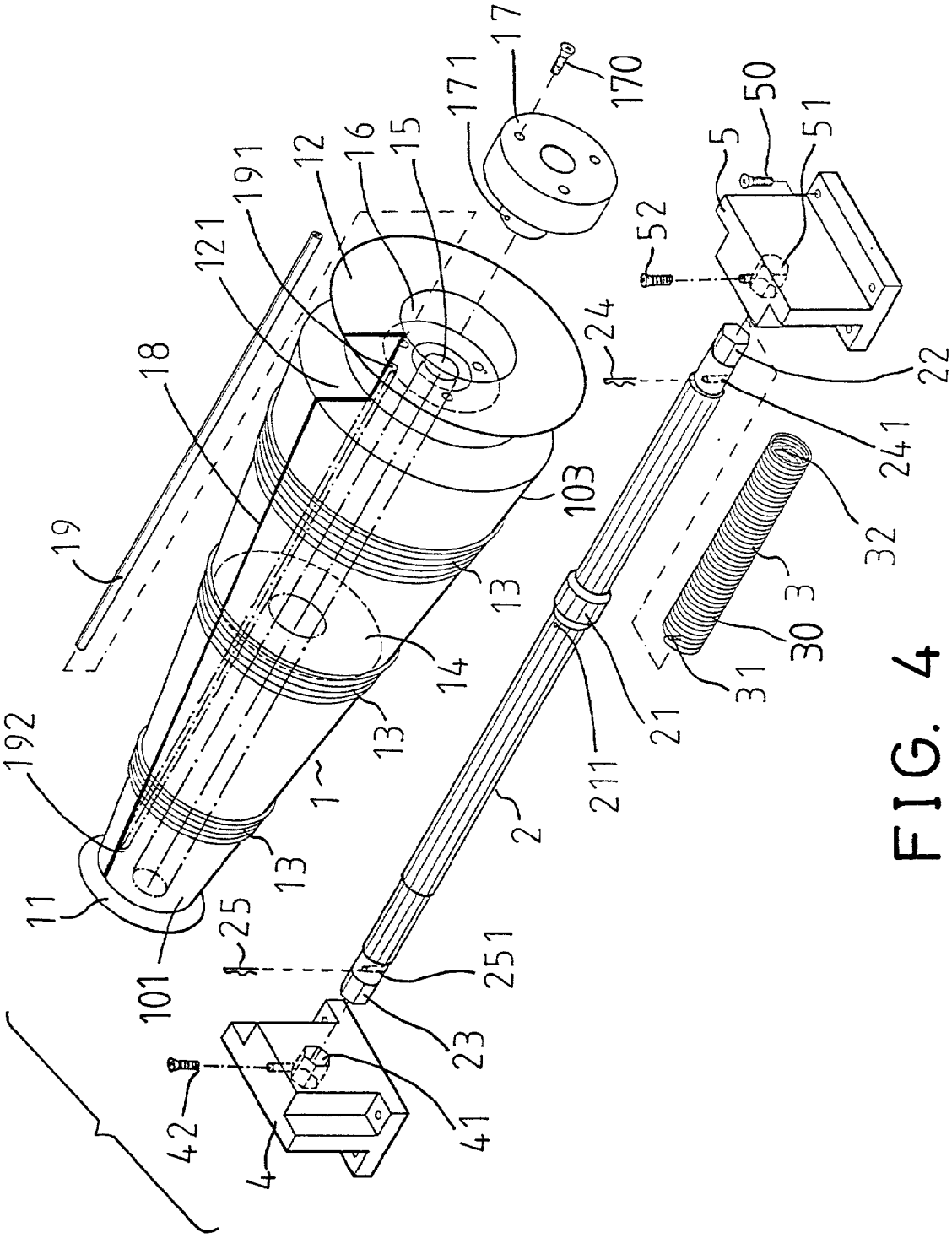

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FIG. 4

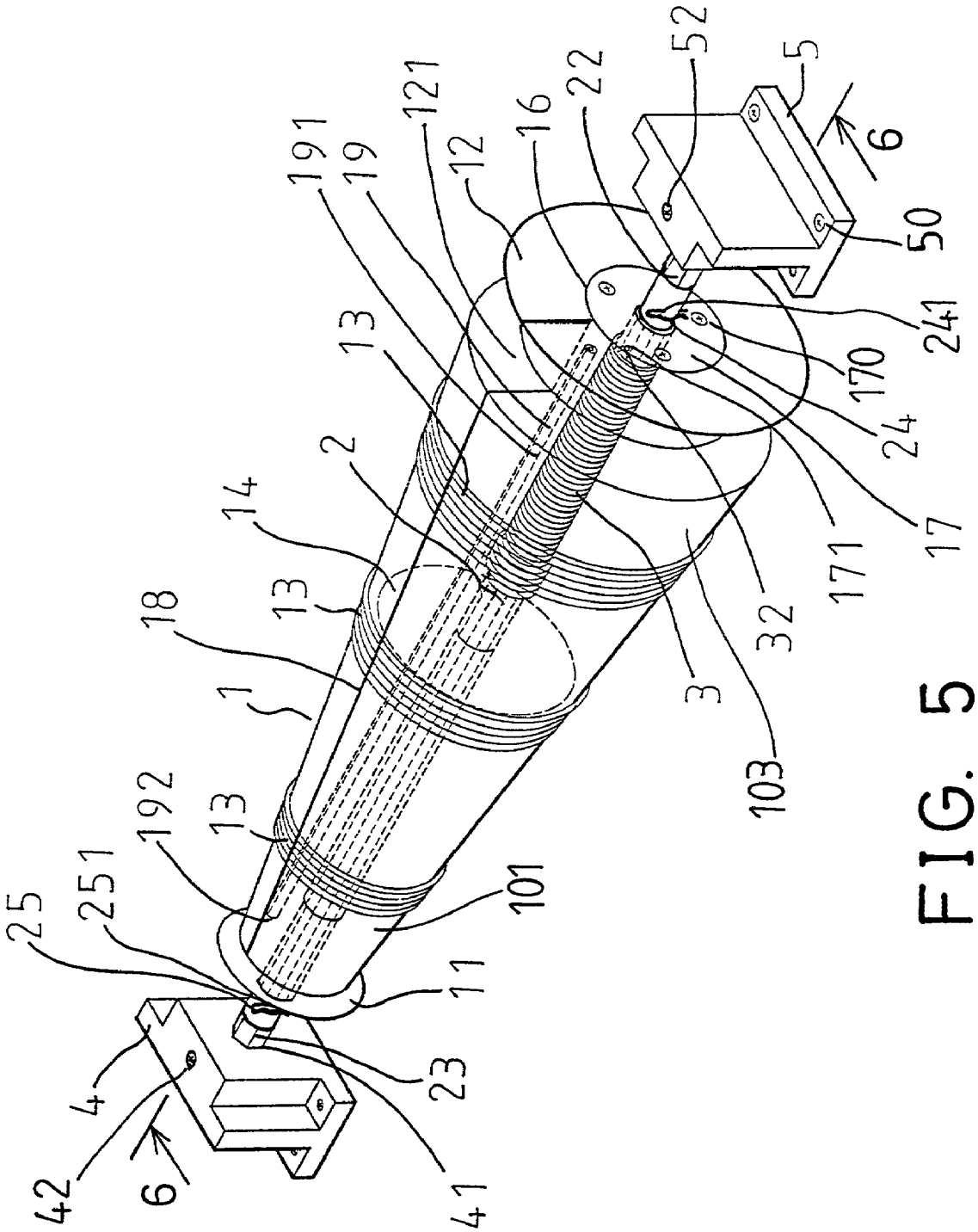
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FIG. 5

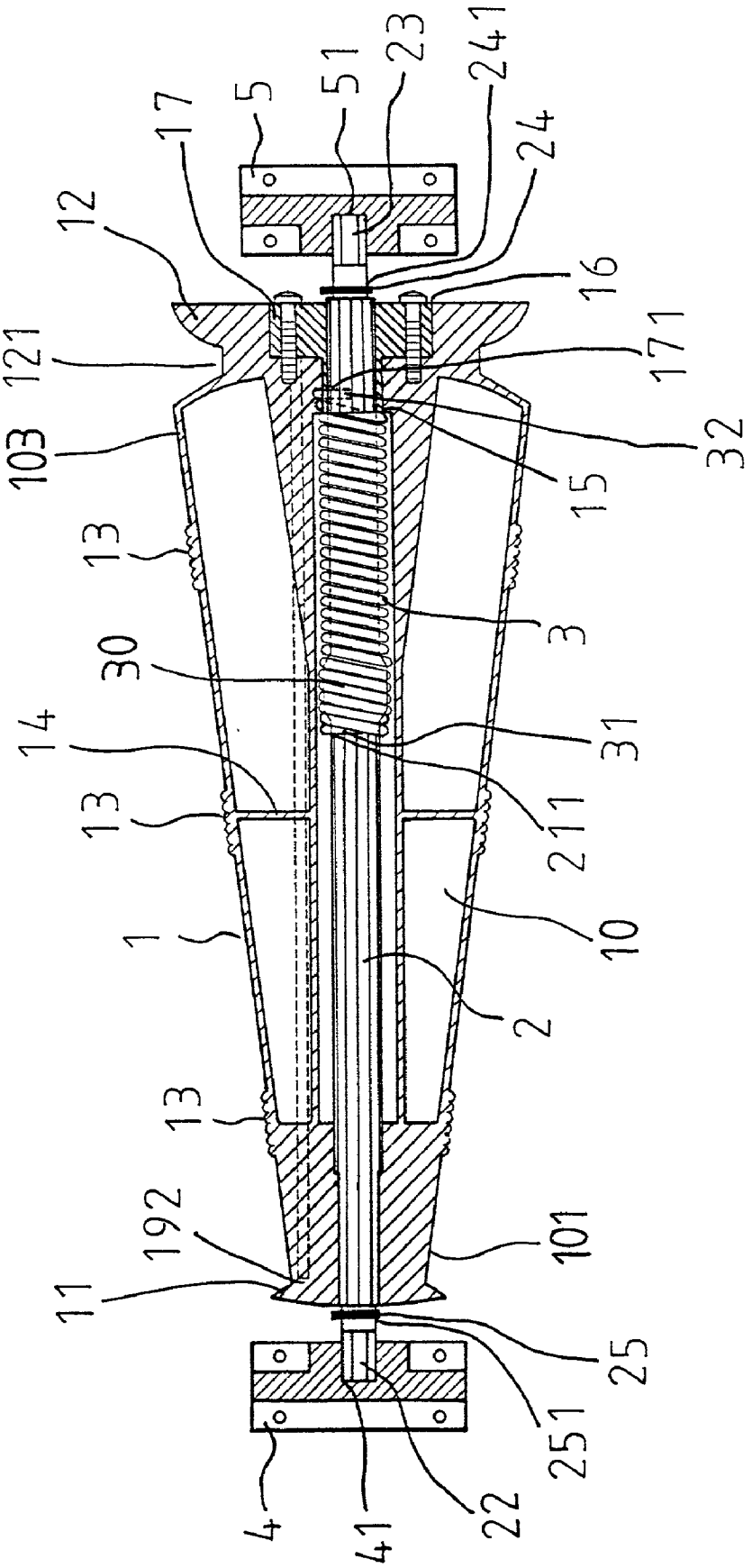
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FIG. 6

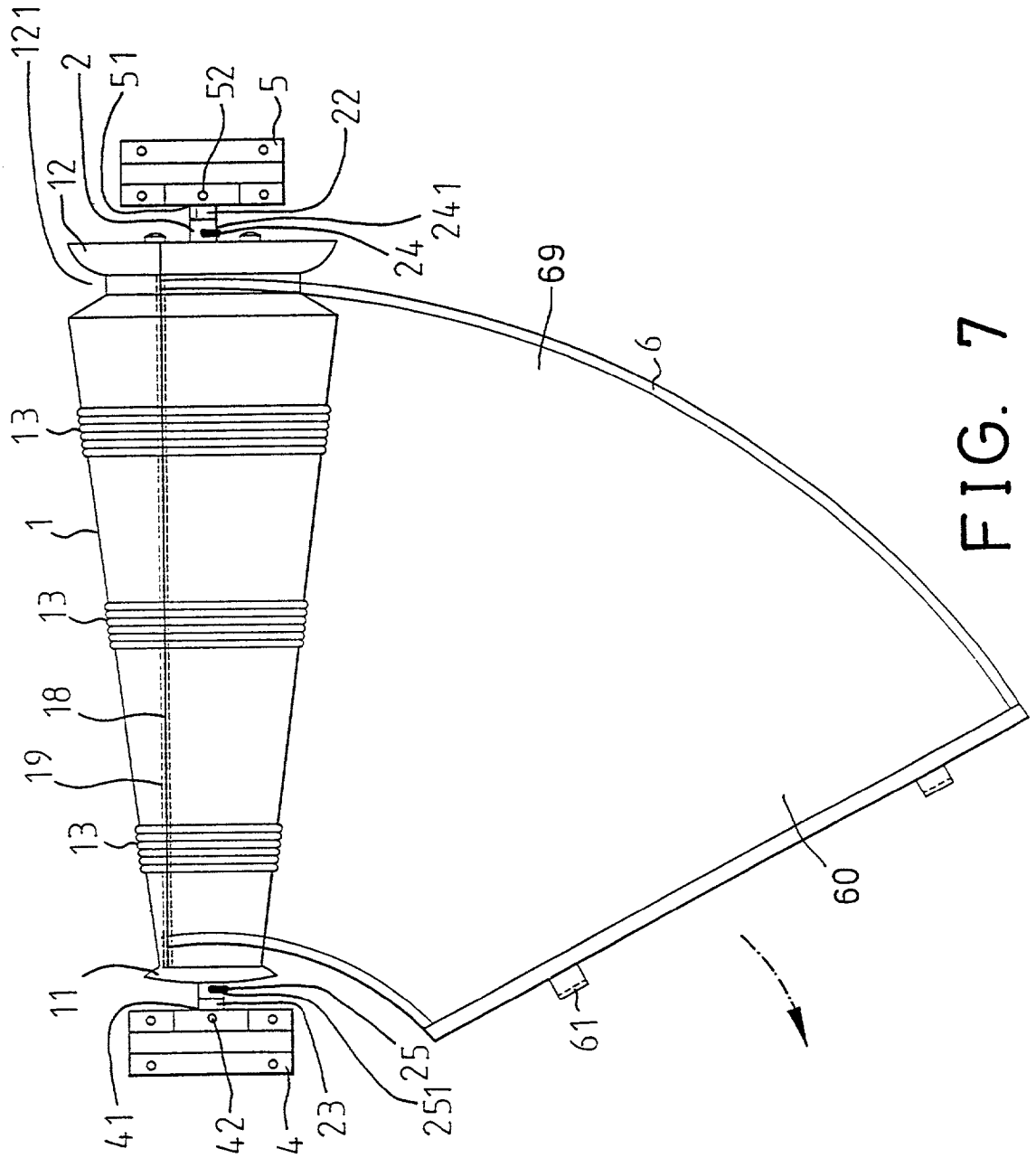
121
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FIG. 7

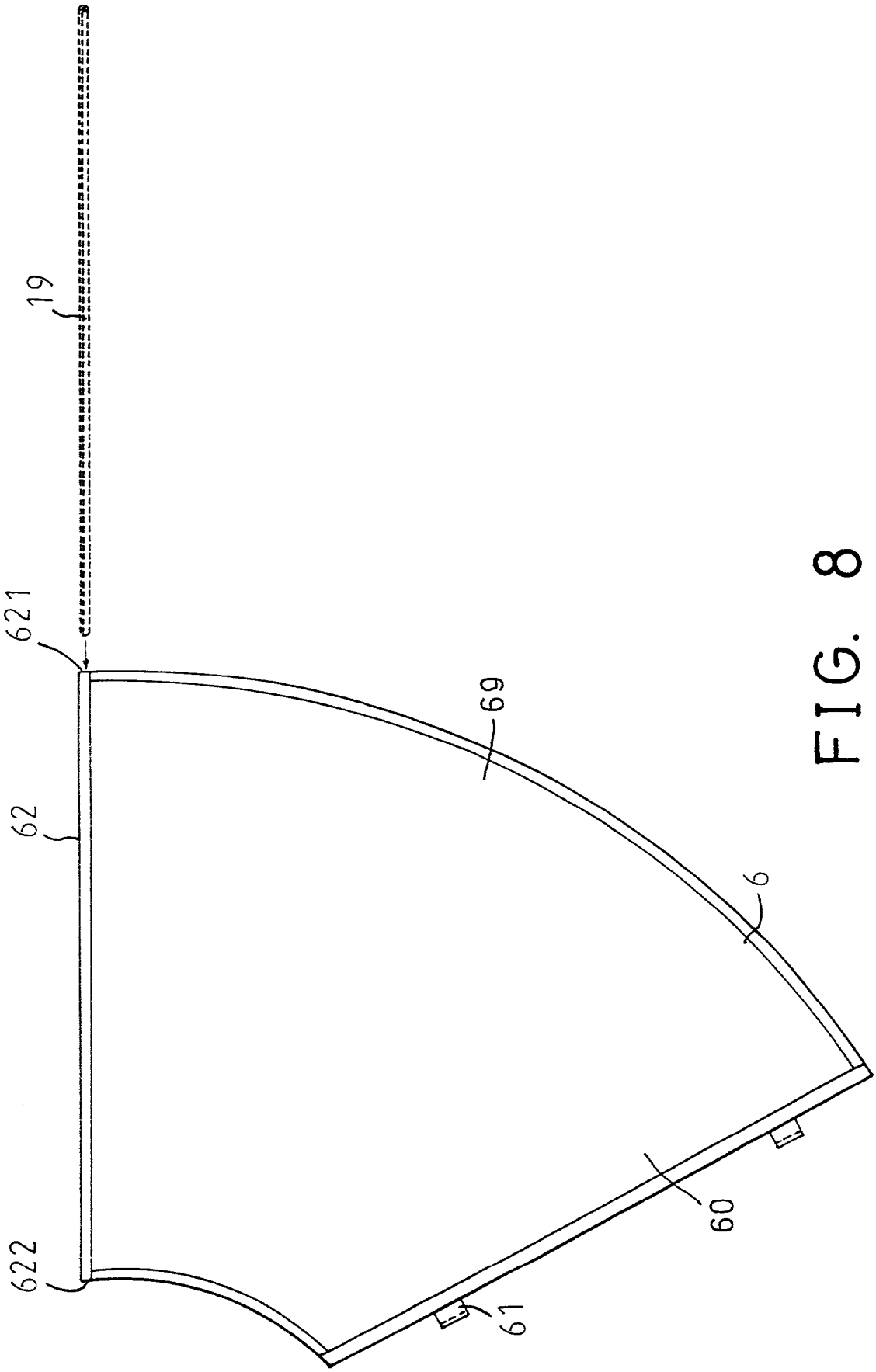

FIG. 8

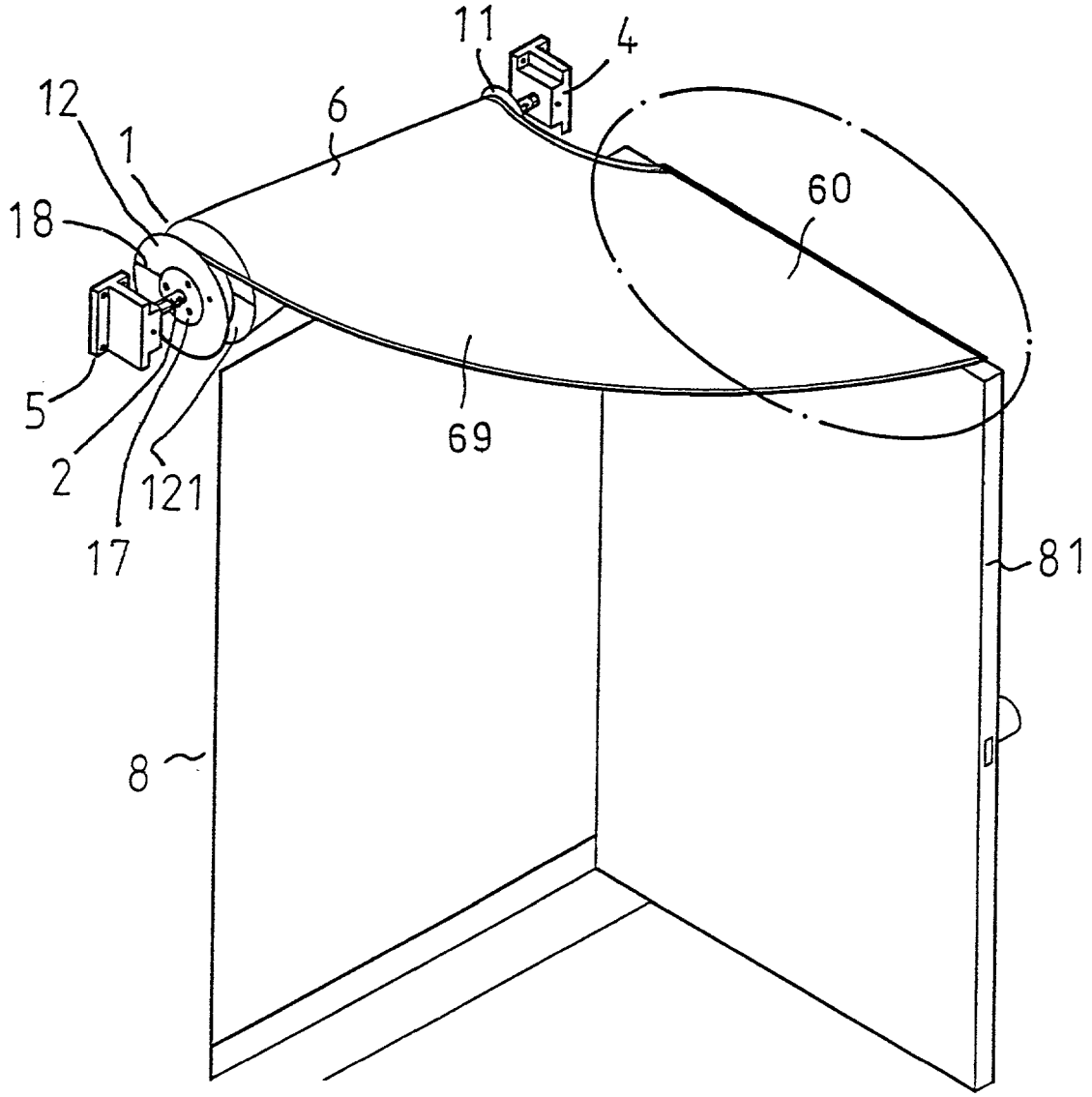

FIG. 9

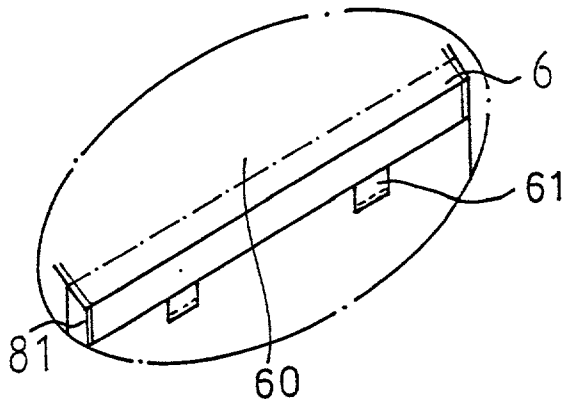

FIG. 10

SHIELDING DEVICE FOR VEHICLE WHILE OPENING THE DOOR

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates to a shielding device, and more particularly to a shielding device or a sun visor for shielding the space between the vehicle and the door of the vehicle, when the vehicle door is opened.

[0003] 2. Description of the Prior Art

[0004] Typically, while opening the vehicle doors or the doors of the buildings, a widely opened space will be formed between the door and the vehicle or the building. These problems particularly trouble or bother the vehicle drivers or passengers or various people, during the raining days, while opening the door of the vehicle or the building.

[0005] Particularly, while opening the door of the vehicle, the vehicle drivers and/or the passengers have to prepare one or more umbrella devices with them and have to open the umbrella devices right after the door of the vehicle has been opened.

[0006] The vehicle drivers and/or the passengers may still have a good chance to be wetted by the rain right after the door of the vehicle has been opened.

[0007] U.S. Pat. No. 6,213,137 to Wang discloses an umbrella automatically openable and extendible toward and above the widely opened space located between the door and the vehicle or the building, for shielding the space between the door and the vehicle or the building. However, the umbrella also may not be completely or fully shield or cover the widely opened space located between the door and the vehicle or the building. In addition, a complicated configuration is required for opening the umbrella. Furthermore, the vehicle drivers and/or the passengers may still have a good chance to be shut by the other people from the upper portions of the buildings.

[0008] The present invention has arisen to mitigate and/or obviate the afore-described disadvantages of the conventional door opening problems of the vehicles.

SUMMARY OF THE INVENTION

[0009] The primary objective of the present invention is to provide a shielding device provided for shielding the space between the vehicle and the door of the vehicle, when the vehicle door is opened, and for preventing the vehicle drivers or passengers from taking and opening an umbrella while opening the vehicle door.

[0010] The other objective of the present invention is to provide a shielding device provided for using as a bullet-proof device while the vehicle door is opened.

[0011] The further objective of the present invention is to provide a shielding device including a shield that is automatically opened to shield the space between the building and the door of the building, while the door of the building is opened.

[0012] In accordance with one aspect of the invention, there is provided a shielding device for shielding a space formed between a door panel and an object when the door panel is opened relative to the object, the shielding device comprising a pair of spaced seats, a shaft disposed between the seats, a spool rotatably engaged on the shaft, the spool including a first end portion and a second end portion, the first end portion of the spool including an outer diameter smaller than that of the second end portion of the spool, and a shield including a sector shape having a first side edge secured to the spool, for allowing the spool to be wound onto or unwound from the spool when the spool is rotated around the shaft, and the shield including a second side edge. The seats and the second side edge of the shield are provided for securing to the object and the door panel respectively for allowing the shield to be unwound from the spool to shield the space formed between the door panel and the object when the door panel is opened relative to the object.

[0013] The spool includes a slit for receiving the first side edge of the shield and for allowing the first side edge of the shield to be secured to the spool.

[0014] The spool includes a longitudinal passage for receiving a rod which is secured to the first side edge of the shield with a sleeve of the shield.

[0015] The spool includes a recess formed in the second end portion and communicating with the longitudinal passage of the spool for receiving and securing a bearing which may retain the rod in the longitudinal passage of the spool.

[0016] A spring biasing device is further provided for recovering the spool after the spool is released, and has a spring secured between the spool and the shaft.

[0017] The spring is preferably a coil spring engaged onto the shaft, and includes a first end secured to the shaft and a second end for securing to the spool.

[0018] The shaft includes a peripheral bulge extended radially outward therefrom, the coil spring includes a portion force-fitted onto the peripheral bulge of the shaft, and one end secured to the spool.

[0019] The spool includes a peripheral bead extended radially outward from the first end portion of the spool, and a peripheral stop extended radially outward from the second end portion of the spool, for retaining the shield on the spool.

[0020] The shield includes an outer peripheral portion, the spool includes a peripheral groove formed in the second end portion thereof for receiving the outer peripheral portion of the shield and for positioning the shield relative to the spool.

[0021] The spool includes a hollow structure having a peripheral chamber formed therein and having at least one reinforcing partition provided therein for reinforcing the spool.

[0022] Further objectives and advantages of the present invention will become apparent from a careful reading of a detailed description provided hereinbelow, with appropriate reference to accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0023] **FIG. 1** is a perspective view of a vehicle having a shielding device in accordance with the present invention for shielding the widely opened space located between the door and the vehicle or the building;

[0024] **FIG. 2** is a perspective view of the shielding device;

[0025] **FIG. 3** is a front view of the shielding device;

[0026] **FIG. 4** is a partial exploded view of the shielding device;

[0027] **FIG. 5** is a perspective view similar to **FIG. 2**, illustrating the inner structure of the shielding device;

[0028] **FIG. 6** is a cross sectional view taken along lines **6-6** of **FIG. 5**;

[0029] **FIGS. 7 and 8** are top plane views of the shielding device;

[0030] **FIG. 9** is a perspective view illustrating the attachment of the shielding device onto a door of a building; and

[0031] **FIG. 10** is an enlarged partial perspective view illustrating the attachment or the securing of the shielding device onto the door panel.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0032] Referring to the drawings, and initially to FIGS. **1-8**, a shielding device in accordance with the present invention is provided for attaching or securing onto the door panel and for covering or shielding the widely opened space located between the door and the vehicle or the building, particularly while opening the door of the vehicle or the building, or while the vehicle drivers or the passengers are getting off the vehicle or while the persons are going out of the housing buildings.

[0033] The shielding device includes a pair of seats **4**, **5** spaced away from each other and secured onto an object, such as the roof of the vehicle **7** (**FIG. 1**), or the wall **8** of the housing or building (**FIG. 9**), with fasteners **50** or locks or the like. The seats **4**, **5** each includes a cavity **41**, **51** formed therein and preferably having a non-circular cross section. A shaft **2** includes two ends **22**, **23** engaged in the cavities **41**, **51** of the seats **4**, **5** and secured to the seats **4**, **5** with fasteners **42**, **52**. It is also preferable that the ends **22**, **23** of the shaft **2** include a non-circular cross section for engaging with the corresponding non-circular cross sectional cavities **41**, **51** of the seats **4**, **5** and for preventing the shaft **2** from rotating relative to the seats **4**, **5**.

[0034] The shaft **2** includes a peripheral bulge **21** extended radially outward from the middle portion thereof, and includes a hole **211** formed in the shaft and located beside the bulge **21**, and includes two apertures **241**, **251** formed in the end portions for receiving a stop pin **24**, **25** therein. A spring **3**, such as a coil spring includes one end portion **30** engaged onto the peripheral bulge **21** with such as a force-fitting engagement, and an end member **31** engaged and secured into the hole **211** of the shaft **21**, and includes the other end member **32**.

[0035] A roller or a spool **1** includes a bore **15** formed therein for receiving the shaft **2** and for rotatably securing the spool **1** onto the shaft **2**, and includes a recess **16** formed in one end thereof for receiving one or more bearings **17** therein which may be secured onto the spool **1** with fasteners **170** and rotated in concert with the spool **1**. The stop pins **24**, **25** are engaged with the ends of the spool **1** for limiting the rotational movement of the spool **1** relative to the shaft **2** and for preventing the spool **1** from moving along the shaft **2**.

[0036] The spool **1** or the bearing **17** includes an orifice **171** formed therein for receiving the other end member **32** of the spring **3**, such that the spool **1** may wind up the spring **3** when the spool **1** is rotated relative to the shaft **2**, and the spring **3** may then apply a spring biasing force to recover the spool **1** when the spool **1** is released. The one end portion **30** of the spring **3** is forced fitted onto the peripheral bulge **21** of the shaft **2**, such that the force of or against the spring **3** may be partially released or dissipated by the peripheral bulge **21** of the shaft **2**.

[0037] The spool **1** preferably includes a hollow structure having a peripheral chamber **10** formed therein and having one or more reinforcing stays or partitions **14** formed or provided therein for reinforcing the spool **1**, and includes a substantially frustum-shaped configuration having one end **101** of a smaller outer diameter, and the other end **103** of a greater outer diameter (FIGS. **4-6**), and includes one or more peripheral ribs **13** formed around the outer peripheral portion thereof for further reinforcing the spool **1**.

[0038] The spool **1** includes a longitudinal passage **191** formed therein and parallel to the bore **15** thereof and communicating with the recess **16** of the spool **1** and having a blind or enclosed end **192**, for receiving a rod **19** therein, and includes a slit **18** formed radially through about one half (½) of the spool **1** and communicating with the longitudinal passage **191** of the spool **1**, for receiving one side or one edge of a cover or a shield **6**. For example, as shown in **FIG. 8**, the shield **6** includes a longitudinal sleeve **62** formed in the one edge thereof and having an open end **621** for receiving the rod **19** and an enclosed end **622** for preventing the rod **19** from being disengaged from the sleeve **62** of the shield **6**.

[0039] As best shown in FIGS. **4-7**, the rod **19** and the sleeve **62** of the shield **6** may be engaged into the longitudinal passage **191** of the spool **1** before the bearing **17** is secured into the recess **16** of the spool **1**, such that the bearing **17** may stably retain the rod **19** and the sleeve **62** of the shield **6** within the longitudinal passage **191** of the spool **1**. The shield **6** includes a substantially sector-shaped configuration for allowing the shield **6** to be suitably wound around the spool **1** (**FIG. 3**) or unwound from the spool **1** (**FIGS. 1, 2, 7, 9**), when the spool **1** is rotated relative to the shaft **2**.

[0040] The other side or edge **60** of the shield **6** may be detachably secured onto the door panel **71** of the vehicle **7** (**FIG. 1**), or onto the door panel **81** (**FIGS. 9, 10**) of the housing or building, with such as the hooks, the locks, the latches, the catches, or with the ears **61** that has a hook and loop device provided thereon which may be engaged with the corresponding hook and loop device provided on the door panel **71**, **81**, for allowing the other edge **60** of the shield **6** to be detachably secured onto the door panels **71**, **81**. The shield **6** may be made of cloth materials, plastic materials, or even bulletproof materials for acting as a sun visor, or a rain shield, or a shield for resisting bullets.

[0041] The spool **1** preferably includes a peripheral bead **11** extended radially outward from the one end **101** of the spool **1**, and a peripheral stop **12** provided or formed or extended radially outward from the other end **103** of the

spool **1** for limiting or retaining the shield **6** around the spool **1** and for preventing the shield **6** from being disengaged from the spool **1**. A peripheral groove **121** is preferably formed and provided beside the peripheral stop **12** of the spool **1**, for receiving the outer peripheral portion **69** of the shield **6** and for further positioning the shield **6** relative to the spool **1**.

[**0042**] In operation, as shown in **FIGS. 1 and 9**, when the door panel **71**, **81** is rotated and opened outward of the object, such as the vehicle **7** or the housing or wall **8**, the shield **6** may be pulled outward or unwound from the spool **1**, and may thus cover or block or shield the widely opened space formed between the door panel **71**, **81** and the vehicle **7** or the wall **8** of the building. The shield **6** may thus be used or acted as a sun visor for shielding the sun shine, or a rain shield for preventing the users from being wetted by the rain, or a shield for resisting bullets.

[**0043**] It is to be noted that the seats **4**, **5** may also be attached or secured onto the door panel **71**, **81**, and the other edge **60** of the shield **6** may be secured onto the object or the vehicle **7** or the wall **8**, such that the shield **6** may also be opened to cover or block or shield the widely opened space formed between the door panel **71**, **81** and the vehicle **7** or the wall **8** of the building when the door panel **71**, **81** is opened relative to the object or vehicle **7** or wall **8**.

[**0044**] Accordingly, the shielding device in accordance with the present invention may be provided for shielding the space between the vehicle and the door of the vehicle, when the vehicle door is opened, and for preventing the vehicle drivers or passengers from being wetted by rain while opening the vehicle door, or for using as a bulletproof device while the vehicle door is opened. The shield may be automatically opened to shield the space between the building and the door of the building, while the door of the building is opened.

[**0045**] Although this invention has been described with a certain degree of particularity, it is to be understood that the present disclosure has been made by way of example only and that numerous changes in the detailed construction and the combination and arrangement of parts may be resorted to without departing from the spirit and scope of the invention as hereinafter claimed.

I claim:

1. A shielding device for shielding a space formed between a door panel and an object when the door panel is opened relative to the object, said shielding device comprising:

a pair of spaced seats,

a shaft disposed between said seats,

a spool rotatably engaged on said shaft, said spool including a first end portion and a second end portion, said first end portion of said spool including an outer diameter smaller than that of said second end portion of said spool, and

a shield including a sector shape having a first side edge secured to said spool, for allowing said spool to be wound onto or unwound from said spool when said spool is rotated around said shaft, and said shield including a second side edge,

said seats and said second side edge of said shield being provided for securing to the object and the door panel respectively for allowing said shield to be unwound from said spool to shield the space formed between the door panel and the object when the door panel is opened relative to the object.

2. The shielding device according to claim 1, wherein said spool includes a slit formed therein for receiving said first side edge of said shield and for allowing said first side edge of said shield to be secured to said spool.

3. The shielding device according to claim 2, wherein said spool includes a longitudinal passage formed therein, and a rod engaged in said longitudinal passage of said spool and secured to said first side edge of said shield.

4. The shielding device according to claim 3, wherein said first side edge of said shield includes a sleeve provided therein for receiving said rod.

5. The shielding device according to claim 3, wherein said spool includes a recess formed in said second end portion thereof and communicating with said longitudinal passage of said spool, and a bearing received in said recess of said spool and secured to said spool, for retaining said rod in said longitudinal passage of said spool.

6. The shielding device according to claim 1 further comprising means for recovering said spool after said spool is released.

7. The shielding device according to claim 6, wherein said recovering means includes a spring secured between said spool and said shaft.

8. The shielding device according to claim 7, wherein said spring is a coil spring engaged onto said shaft, and includes a first end secured to said shaft and a second end for securing to said spool.

9. The shielding device according to claim 8, wherein said shaft includes a peripheral bulge extended radially outward therefrom, said coil spring includes a portion force-fitted onto said peripheral bulge of said shaft.

10. The shielding device according to claim 7, wherein said spool includes a recess formed in said second end portion thereof, and a bearing received in said recess of said spool and secured to said spool and rotated in concert with said spool, said spring includes a first end secured to said bearing.

11. The shielding device according to claim 1, wherein said spool includes a peripheral bead extended radially outward from said first end portion of said spool, and a peripheral stop extended radially outward from said second end portion of said spool, for retaining said shield on said spool.

12. The shielding device according to claim 1, wherein said shield includes an outer peripheral portion, said spool includes a peripheral groove formed in said second end portion thereof for receiving said outer peripheral portion of said shield and for positioning said shield relative to said spool.

13. The shielding device according to claim 1, wherein said spool includes a hollow structure having a peripheral chamber formed therein and having at least one reinforcing partition provided therein for reinforcing said spool.

* * * * *