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**B7H** HC H602 H713 H741

(56) Documents Cited:
**GB 2279921 A** **DE 010113090 A1**
**DE 010033327 A1** **US 4598923 A**

(58) Field of Search:
INT CL[7] **B62K, B62M**
Other: **Online: WPI, EPODOC, JAPIO**

(54) Abstract Title: **Folding and portable electric scooter**

(57) A folding and portable electric scooter (with reference to Fig. 2) assembled from structural members including a body member (1), a cover member (2), a seat frame (3) and handles (4, 5). When the electric scooter is not in use, a user needs only employ three simple actions to facilitate rapid folding away and realize formation of a portable electric scooter, namely to fold down handles (4, 5) into the cover member (2), and fold away the cover member (2) and the seat frame (3) into the body member (1), whereupon, the user can pull on a pull rod (20) configured atop the cover member (2) to effortlessly pull along the electric scooter by means of auxiliary wheels (18) connected to the body member (1), similar to pulling along of baggage. When the user wishes to ride the electric scooter, the user needs only to implement three simple maneuvers to open up the folded electric scooter, namely to pull open the cover member (2), the seat frame (3) and the handles (4, 5), whereupon the cover member (2) instantly forms a front frame of the electric scooter. Thereupon, the user can switch on electrical power and thus enable the user to ride the electric scooter. The front frame formed by the cover member (2) also actualizes functionality as a shield from wind and rain.

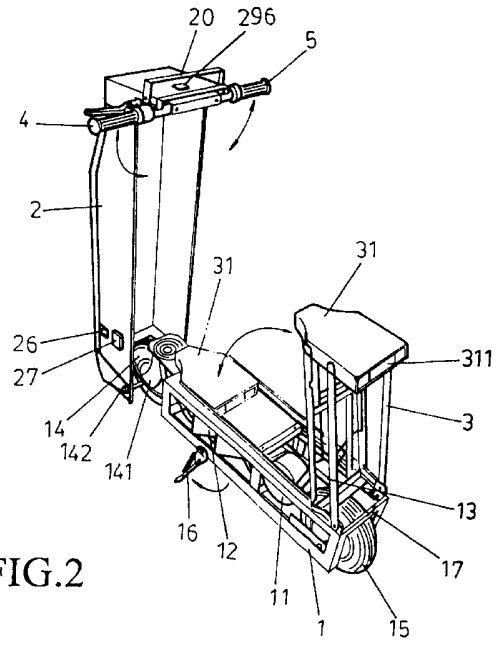


FIG.2

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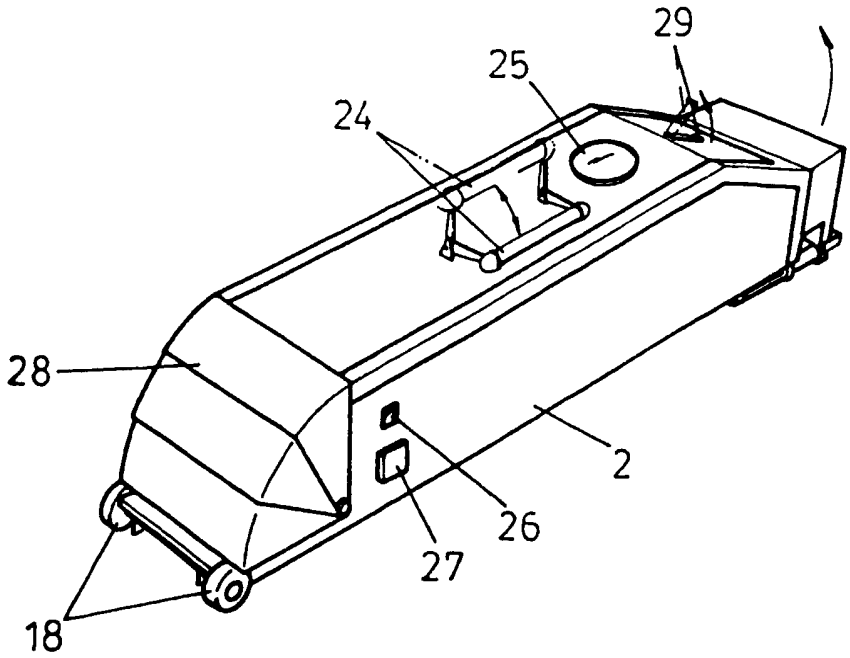
29
25
24
28
2
26
27
18

FIG.1

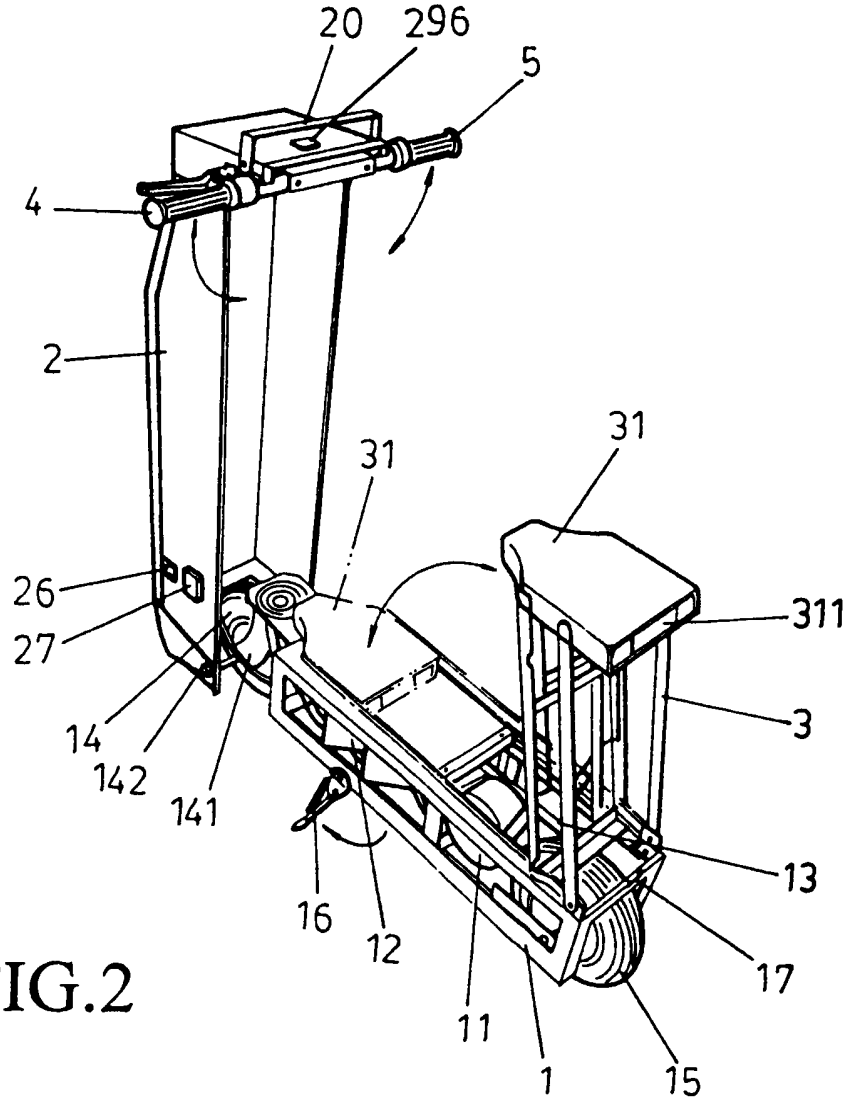
20
296
5
4
2
31
31
26
27
311
3
14
142
141
13
16
12
17
11
1
15

FIG.2

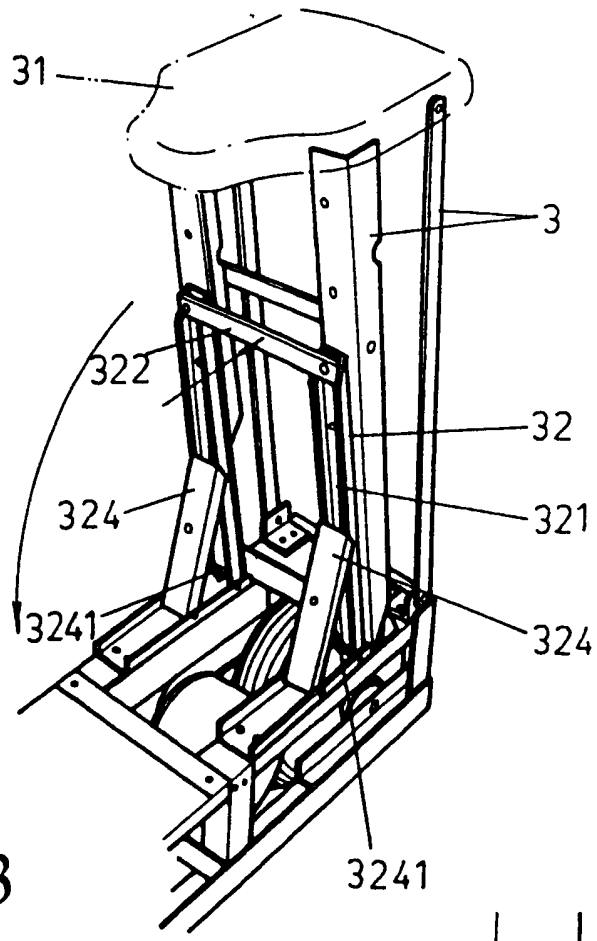


FIG.3

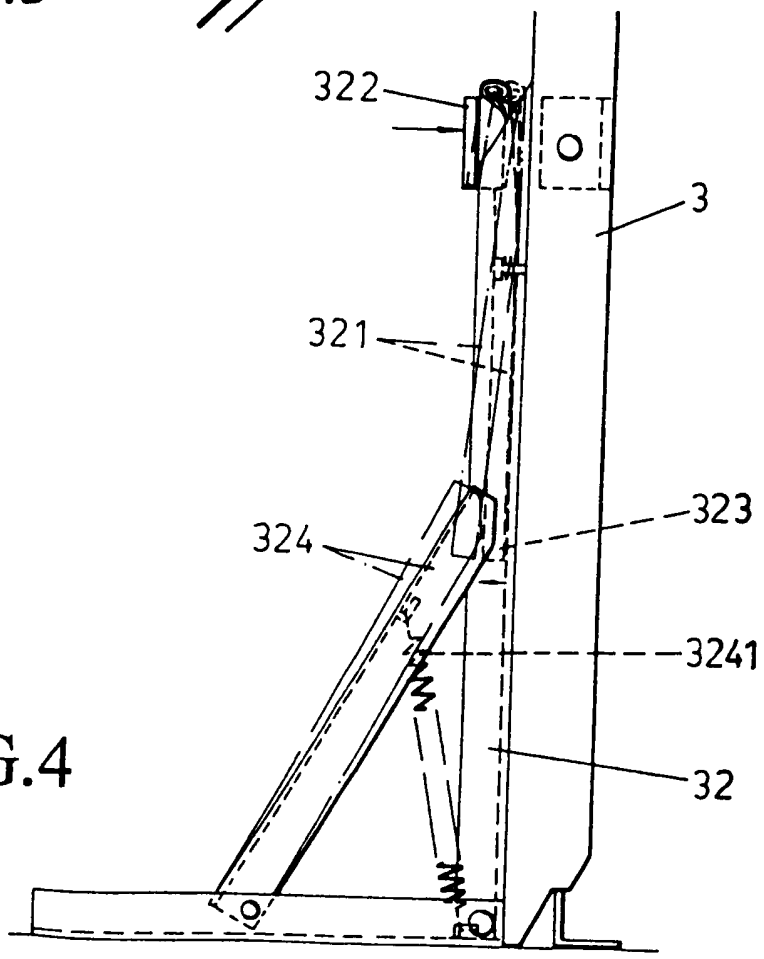


FIG.4

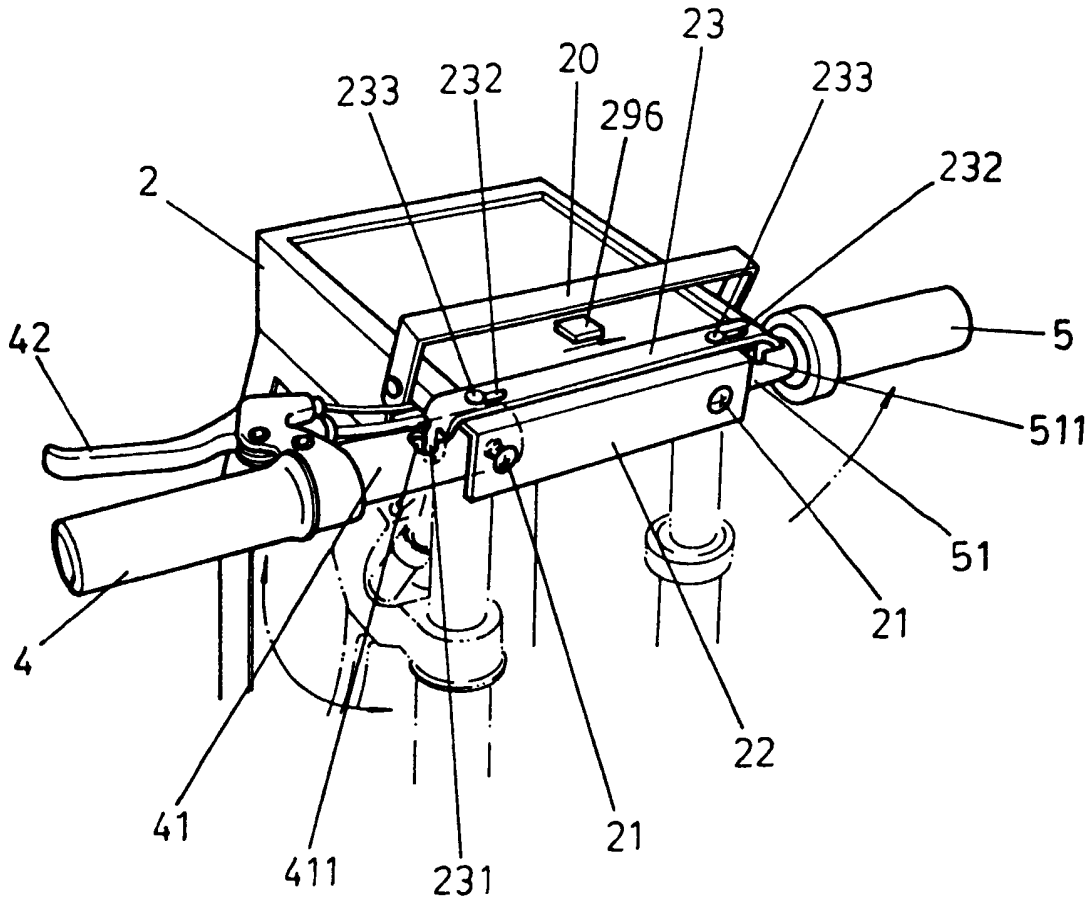


FIG.5

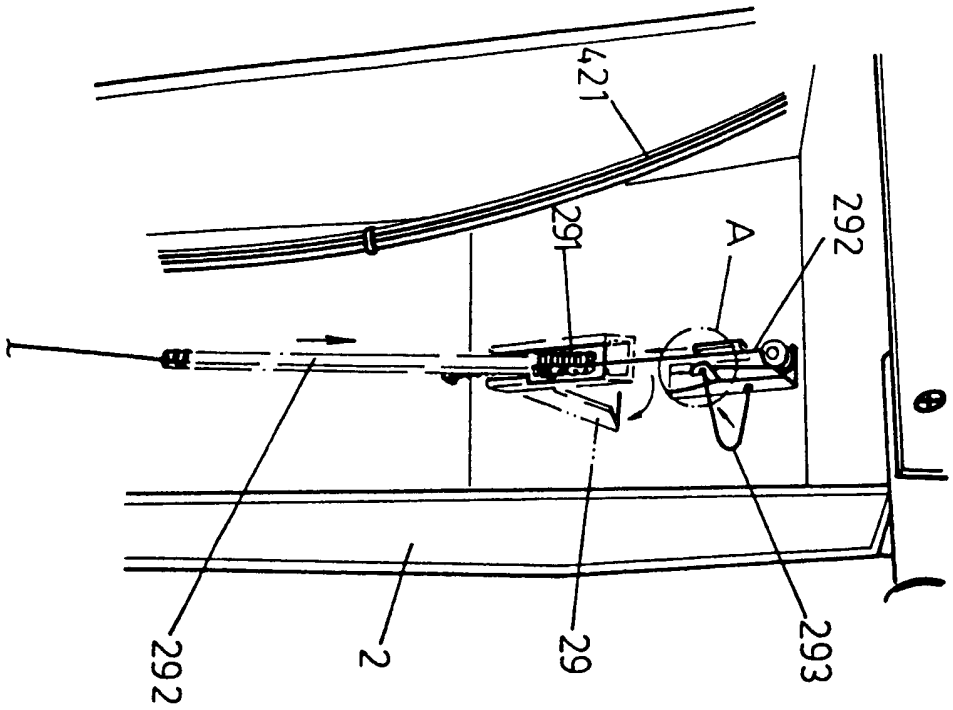


FIG.6

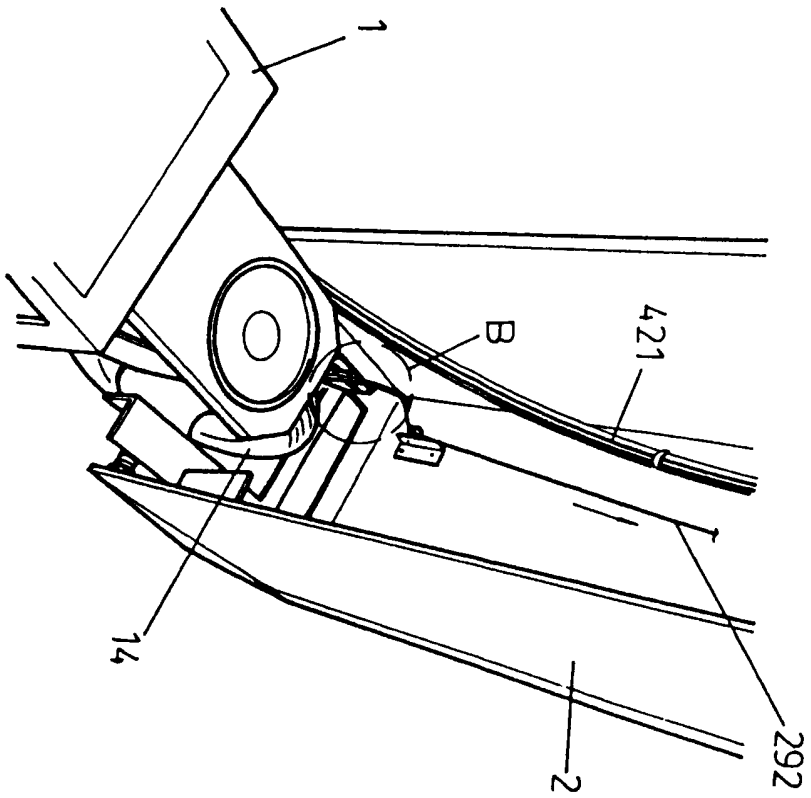


FIG.7

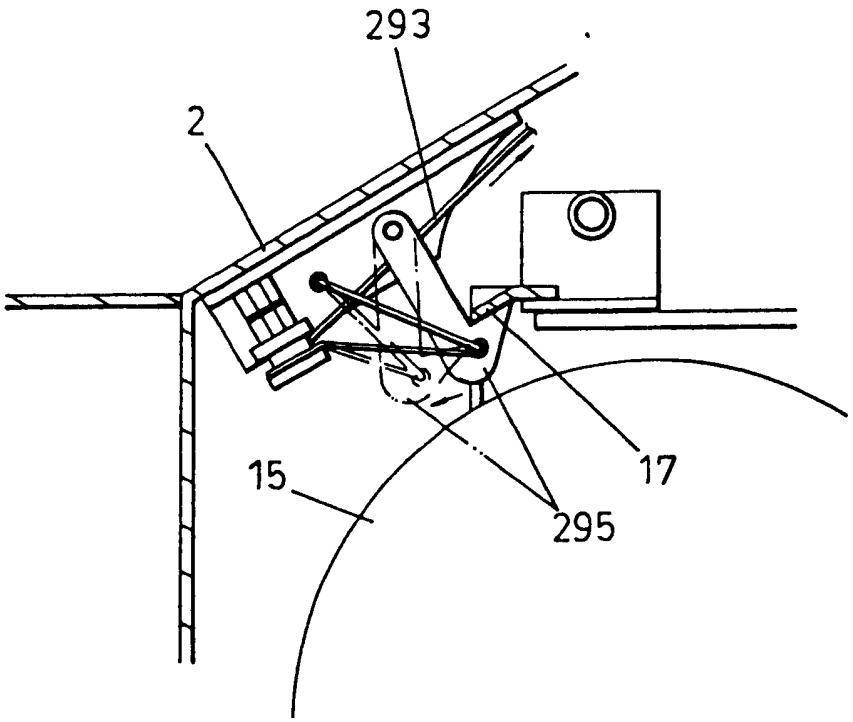


FIG.8

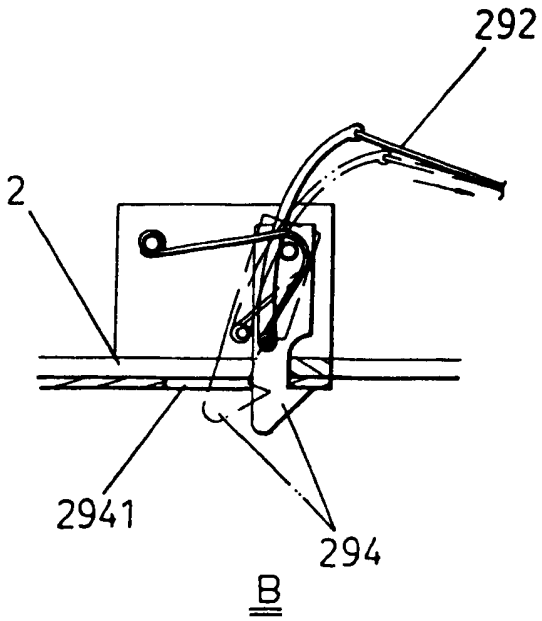


FIG.9

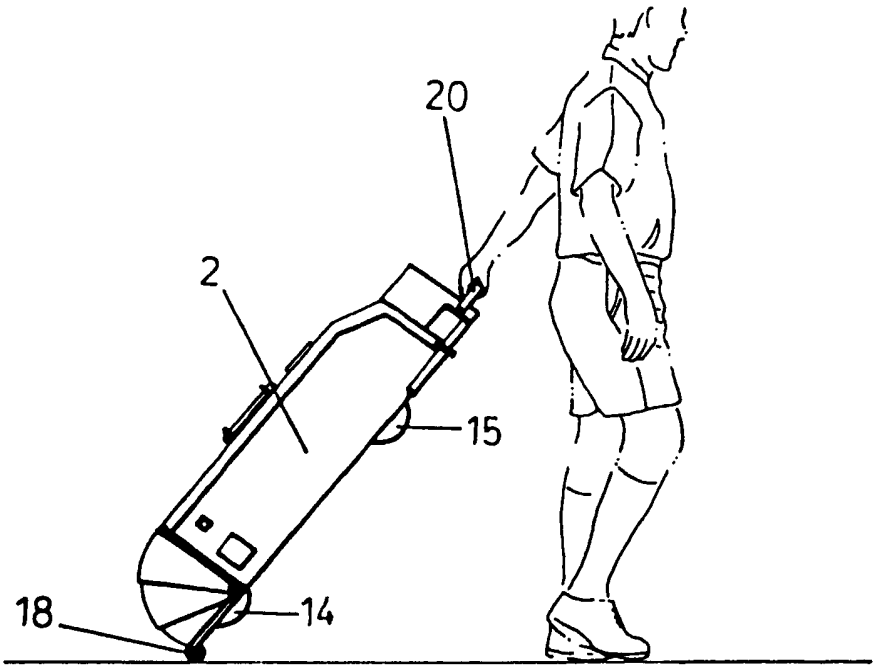


FIG.10

# FOLDING AND PORTABLE ELECTRIC SCOOTER

The present invention relates to a scooter, and more particularly to an electric scooter that can be folded away into a baggage-like form which can be carried or auxiliary wheels configured on the electric scooter can be utilized to enable a user to pull along and thereby transport the electric scooter for easy portability.

A majority of conventional electric scooters cannot be folded away into a baggage-like form, thus when transporting the electric scooter cannot be neatly put away or carried along when traveling on a rapid transit transportation system, and so on. Moreover, bulkiness of the electric scooter makes transporting of the electric scooter difficult.

A primary objective of the present invention is to provide a configuration that employs three simple actions to facilitate rapid folding away and realizes formation of a portable electric scooter. Prior to usage, the electric scooter can be folded away and thus form a reduced size baggage-like form which can be carried or auxiliary wheels configured on the electric scooter can be utilized to enable a user to pull along the electric scooter onto a rapid transit system or facilitate transport storage thereof. When the user wishes to ride the electric scooter, the user needs only to implement three simple maneuvers to open up the folded scooter, namely to pull open a cover member, a seat frame and handles, thereby quickly assembling the

electric scooter ready for the user to ride thereon. Wherein the cover member instantly forms a front frame of the electric scooter, and apart from actualizing functionality as a shield from wind and rain, also provides for an attractive appearance after folding away of the configuration.

Another objective of the present invention is provide a structure with two auxiliary wheels respectively configured on outer sides of a front wheel of a body member, and a pull rod configured on a front edge of a cover member, whereby, when the present invention has been folded away to form a baggage-like form, pulling on the pull rod by the user enables effortlessly pulling along of the electric scooter by means of the auxiliary wheels, similar to pulling along of baggage.

To enable a further understanding of the said objectives and the technological methods of the invention herein, the brief description of the drawings below is followed by the detailed description of the preferred embodiments.

Preferred embodiments of the present invention will now be described by way of example only with reference to the accompanying drawings, in which:

FIG. 1 shows a general view of an electric scooter after folding away according to the present invention.

FIG. 2 shows a general view of the electric scooter after opening up according to the present invention.

FIG. 3 shows a partial structural view of a seat frame and a body member according to the present invention.

FIG. 4 shows a schematic side view of the seat frame and the body member according to the present invention.

FIG. 5 shows a structural view of a cover member and handles according

to the present invention.

FIG. 6 shows a partial structural view of the cover member lifted up according to the present invention.

FIG. 7 shows another partial structural view of the cover member lifted up according to the present invention.

FIG. 8 shows a structural view of A-section of FIG. 6 according to the present invention.

FIG. 9 shows a structural view of B-section of FIG. 7 according to the present invention.

FIG. 10 shows a schematic view of an embodiment according to the present invention.

Referring to FIGS. 1 and 2, which show structural members of an electric scooter of the present invention primarily comprising a body member 1, a cover member 2, a seat frame 3 and two handles 4 and 5. Wherein the body member 1 comprises a rectangular frame, interior of which is installed a transmission device comprising an electric motor 11, a battery 12 and a belt 13. A front wheel 14 and a rear wheel 15 are pivot jointed to a front and rear end of the body member 1 respectively. A foot stand 16 is fixedly positioned to a side of the body member 1. The electric motor 11 drives the belt 13, and the belt 13 wraps round a hub at a side of the rear wheel 15. The aforementioned transmission device is of conventional structure, while the present invention is characterized in that:

A wheel frame 141 of the front wheel 14 is pivot jointed to the cover

member 2 by means of a bolt 142, and the cover member 2 is adapted to assume an reverse U-shaped frame cover, therewith enabling complete covering of the body member 1 (see FIGS. 1 and 2). The two handles 4 and 5 are configured on a moveable end of the cover member 2. As depicted in FIG. 5, a reverse U-shaped bracket 22 is bolted onto the cover member 2 by means of screws 21. A reverse U-shaped fastening bracket 23 is configured atop the reverse U-shaped bracket 22. Each end of the fastening bracket 23 is downwardly bent to respectively form a neck, and a fastening hook 231 is respectively configured on each of the necks thereof. Trumpet-shaped fastening holes 411 and 511 are defined in handlebars 41 and 51. The fastening holes 411 and 511 provide for the fastening hooks 231 of the fastening bracket 23 to hook and fasten position thereinto. A trumpet-shaped recess hole 232 is defined on each of two ends atop the fastening bracket 23. A fixing bolt 233 is bolted into each of the recess holes 232, and fixes position therein. The fastening bracket 23 utilizes the fixing bolts 233 to alter position within the recess holes 232, and thereby facilitate fastening down or loosening of the two handles 4 and 5. Upon the handles 4 and 5 being loosened, the handles 4 and 5 can thereby be folded down and stored within the cover member 2.

Referring to FIGS. 3 and 4, a seat 31 is installed atop the seat frame 3 configured at a tail end of the body member 1, and a brake light 311 is configured at a rear of the seat 31 (see FIG. 2). The seat frame 3 can be folded flat within the body member 1, and can be pulled back to an upright position thereby enabling a rider to sit atop the seat 31. Folding structure of the seat frame 3 comprises a C-shaped bar 32 respectively bolted to each of

two front sides of the seat frame 3. A movable strip 321 is configured interior of each of the bars 32, and a holding bar 322 is configured between and joins extremities of the two moveable strips 321. A hook eye 323 is appropriately defined center of each of the bars 32 respectively, and the hook eyes 323 respectively provide for inclined wedge pieces 324 to respectively fasten thereinto. A spring 3241 is connected to an underside of each of the wedge pieces 324. Referring to FIG. 4, when a user wishes to fold away the seat frame 3, the user needs only to firmly grasp the holding bar 322 and push down, thereby enabling the moveable strips 321 to outwardly push the wedge pieces 324, and thus separate the wedge pieces 324 from being fastened in the hook eyes 323, whereupon the entire seat frame 3 is thereby enabled to be folded down and concealed within the body member 1.

Referring to FIG. 1, a foldaway carry handle 24 is configured on top of the cover member 2, wherewith enables the present invention to be lifted by hand. A headlight 25 is configured at a side of the carry handle 24, and a power switch 26 and a battery charge switch cover 27 are configured on a side face of the cover member 2. A three-fold panel is configured on a frontal section at a tail end of the cover member 2, therewith enabling covering of a frontal end of the body member 1. Referring to FIG. 5, a power indicator light 296 is configured on an end of the cover member 2 close to the handle 4. A brake 42 is bolted to the handle 4, and the brake 42 is connected to a braking system by means of a brake cable (see FIGS. 6 and 7). A loose pull-bar 29 is configured on a back of the cover member 2, and referring to FIG. 6, the user can upwardly pull on the loose pull-bar 29,

whereupon the loose pull-bar 29 having a spring 291 configured therein tugs on two pull cables 292 and 293, thus enabling a fastening hook 294 to disengage fastening from a locating hole 2941 of the front wheel frame 141 of the cover member 2 (see FIG. 9), while another fastening hook 295 disengages fastening from a fastening edge 17 of a rear wheel frame of the body member 1 (see FIG. 8). FIG. 2 shows the electric scooter opened up, whereupon the cover member 2 instantly forms a front frame of the electric scooter, and actualizes functionality as a shield from wind and rain similar to a conventional motor scooter.

Furthermore, two auxiliary wheels 18 are provided on a frontal section of the front wheel 14 of the body member 1 (see FIG. 1). A foldaway pull rod 20 is configured on a frontal section of the cover member 2 (see FIG. 2). Upon the present invention being folded and thus forming a baggage-like form, as FIG. 10 shows, the user can pull on the pull rod 20, and thereby enable the scooter to be pulled along ground by means of the auxiliary wheels 18.similar to pulling along of baggage.

In conclusion, the present invention employs three simple actions to facilitate rapid folding away and formation of a baggage-like body that is portable or utilizes the configured auxiliary wheels 18 to enable the user to pull along the scooter into rapid transit transportation stations, and so on. The electric scooter of the present invention thus provides for transportability and easy storing thereof. Hence, when the user wishes to ride the scooter, the user needs only to implement three simple maneuvers to open up the folded scooter, namely to pull open the cover member 2, the seat frame 3 and the two handles 4 and 5, thereby quickly assembling the

electric scooter for the user to ride thereon.

It is of course to be understood that the embodiments described herein is merely illustrative of the principles of the invention and that a wide variety of modifications thereto may be effected by persons skilled in the art without departing from the spirit and scope of the invention as set forth in the following claims.

**CLAIMS**

1. A folding and portable electric scooter comprising a body member, a cover member, a seat frame and two handles, wherein interior of the body member is installed a transmission device comprising an electric motor, a battery and a belt; a front wheel and a rear wheel are pivot jointed to a front and rear end of the body member respectively, and a foot stand is fixedly positioned to a side of the body member; the electric motor drives the belt, and the belt wraps round a hub at a side of the rear wheel; and is characterized in that:

the cover member is pivot jointed to a wheel frame of the front wheel, and the two handles are configured on a moveable end of the cover member; an reverse U-shaped bracket is bolted onto the cover member, and an reverse U-shaped fastening bracket is configured atop the reverse U-shaped bracket; each end of the fastening bracket is downwardly bent to respectively form a neck, and a fastening hook is respectively configured on each of the necks thereof, fastening holes defined in handle bars provide for the fastening hooks of the fastening bracket to hook and fasten position thereinto; a recess hole is defined on each of two ends atop the fastening bracket, and a fixing bolt is bolted into each of the recess holes, moreover, the fastening bracket utilizes the fixing bolts to alter position within the recess holes, and thereby facilitate fastening down or loosening of the handles; upon the electric scooter being folded away, the cover member completely covers the body member, and when the electric scooter is in usage, the cover member functions as a front frame for the electric scooter;

a seat is installed atop the seat frame configured at a tail end of the body member, and the seat frame can be folded away into the body member; a bar is respectively bolted to each of two front sides of the seat frame, and a movable strip is configured interior of each of the bars, a holding bar is configured between and joins extremities of the two moveable strips; a hook eye is respectively defined in each of the bars and provide for inclined

wedge pieces to respectively fasten thereinto; a spring is connected to an underside of each of the wedge pieces; pushing down on the holding bar thereby enables the moveable strips to outwardly push the wedge pieces, and thus separate the wedge pieces from being fastened in the hook eyes, whereupon the seat frame can be folded down, if the seat frame is lightly pulled back to an upright position, a fastening is utilized to fix position and thereby enable formation of a seat.

2. The folding and portable electric scooter in accordance with claim 1, wherein a foldaway carry handle is configured on top of the cover member, a headlight is configured at a side of the carry handle; a power switch and a battery charge switch cover are configured on a side face of the cover member, and a folding panel is configured on a frontal section at a tail end of the cover member.

3. The folding and portable electric scooter in accordance with claim 1 or claim 2, wherein a brake device is bolted to the handle, and the brake is connected to a braking system by means of a brake cable.

4. The folding and portable electric scooter in accordance with any one of the preceding claims, wherein a loose pull-bar is configured on a back of the cover member, and upwardly pulling on the loose pull-bar tugs on two pull cables, whereupon the two pull cables respectively actuate two fastening hooks to disengage fastening from a locating hole of the wheel frame of the front wheel of the cover member and a fastening edge of a rear wheel frame of the body member, thereby opening up the electric scooter; when folding away the electric scooter, pulling up on the loose pull-bar tugs the two pull cables, and actuates the fastening hook to disengage fastening from the locating hole, thereby enabling folding away of the front frame.

5. The folding and portable electric scooter in accordance with any one of the preceding claims, wherein two auxiliary wheels are configured on a frontal section of the front wheel of the body member, and a pull rod is configured on a frontal section of the cover member, upon folding away,

pulling on the pull rod, thereby enables the electric scooter to be pulled along ground by means of the auxiliary wheels.

6. The folding and portable electric scooter in accordance with any one of the preceding claims, wherein a brake light is configured at a rear of the seat installed atop the seat frame.

7. The folding and portable electric scooter substantially as hereinbefore described with reference to or as shown in the accompanying drawings.

INVESTOR IN PEOPLE

**Application No:** GB 0403143.1 **Examiner:** Peder Emborg
**Claims searched:** 1 - 7 **Date of search:** 9 November 2004

# Patents Act 1977 : Search Report under Section 17

## Documents considered to be relevant:

| Category | Relevant to claims | Identity of document and passage or figure of particular relevance | |
|---|---|---|---|
| A | - | US 4598923 A | (LAJOS CSIZMADIA)<br>See abstract and figures pos. 2 |
| A | - | GB 2279921 A | (THOMAS WAYNE RICHARDS)<br>See abstract and figures |
| A | - | DE 10113090 A1 | (GIWA KUNSTSTOFF UND METALLVERABEITUNG GmbH & Co.)<br>See figures and abstract |
| A | - | DE 10033327 A1 | (HUDORA GMBH)<br>See figures and abstract |

Categories:

| | | | |
|---|---|---|---|
| X | Document indicating lack of novelty or inventive step | A | Document indicating technological background and/or state of the art |
| Y | Document indicating lack of inventive step if combined with one or more other documents of same category | P | Document published on or after the declared priority date but before the filing date of this invention |
| & | Member of the same patent family | E | Patent document published on or after, but with priority date earlier than, the filing date of this application |

## Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC[W].

Worldwide search of patent documents classified in the following areas of the IPC[7]:

B62K, B62M

The following online and other databases have been used in the preparation of this search report:

WPI, EPODOC, JAPIO