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(54) **REMNANT SNOW REMOVING APPARATUS FOR SNOW THROWERS**

(52) **U.S. Cl. .... 37/253**

(57) **ABSTRACT**

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A remnant snow removing apparatus for a snow thrower includes a scraper bucket and at least one extension panel located on the scraper bucket. The scraper bucket includes a central plate and two side plates at two sides of the central plate. The extension panel is extended from one side plate to clear remnant snow scattered during snow clearing. The scraper bucket and extension panel further have respectively a first coupling portion and a second coupling portion that include respectively a plurality of first positioning surfaces and second positioning surfaces that are latched with each other for positioning. The first positioning surfaces and second positioning surfaces are formed annularly on the first and second coupling portions in equiangular and polygonal structures. Users can assemble and disassemble the extension panel and adjust the included angle between the extension panel and scraper bucket according to their requirements.

(21) **Appl. No.: 12/981,230**

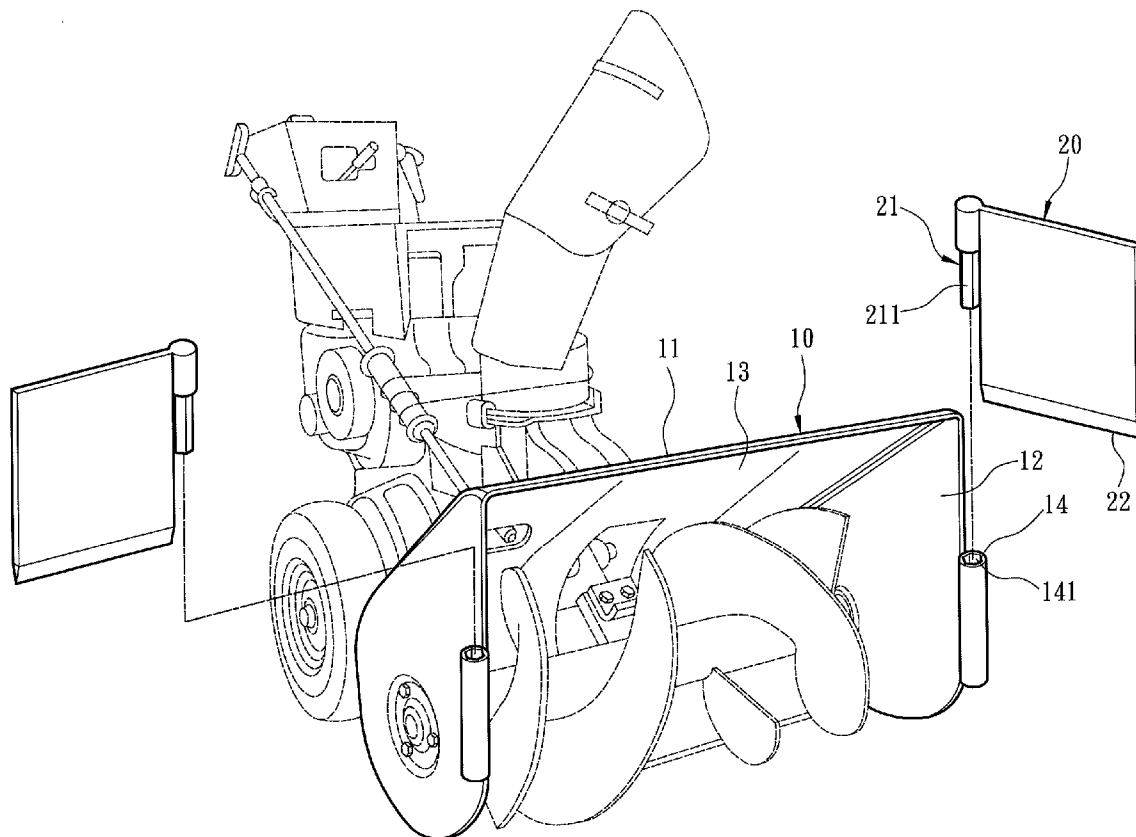
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**Related U.S. Application Data**

(63) Continuation-in-part of application No. 12/754,678, filed on Apr. 6, 2010, now abandoned.

**Publication Classification**

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**E01H 5/04** (2006.01)



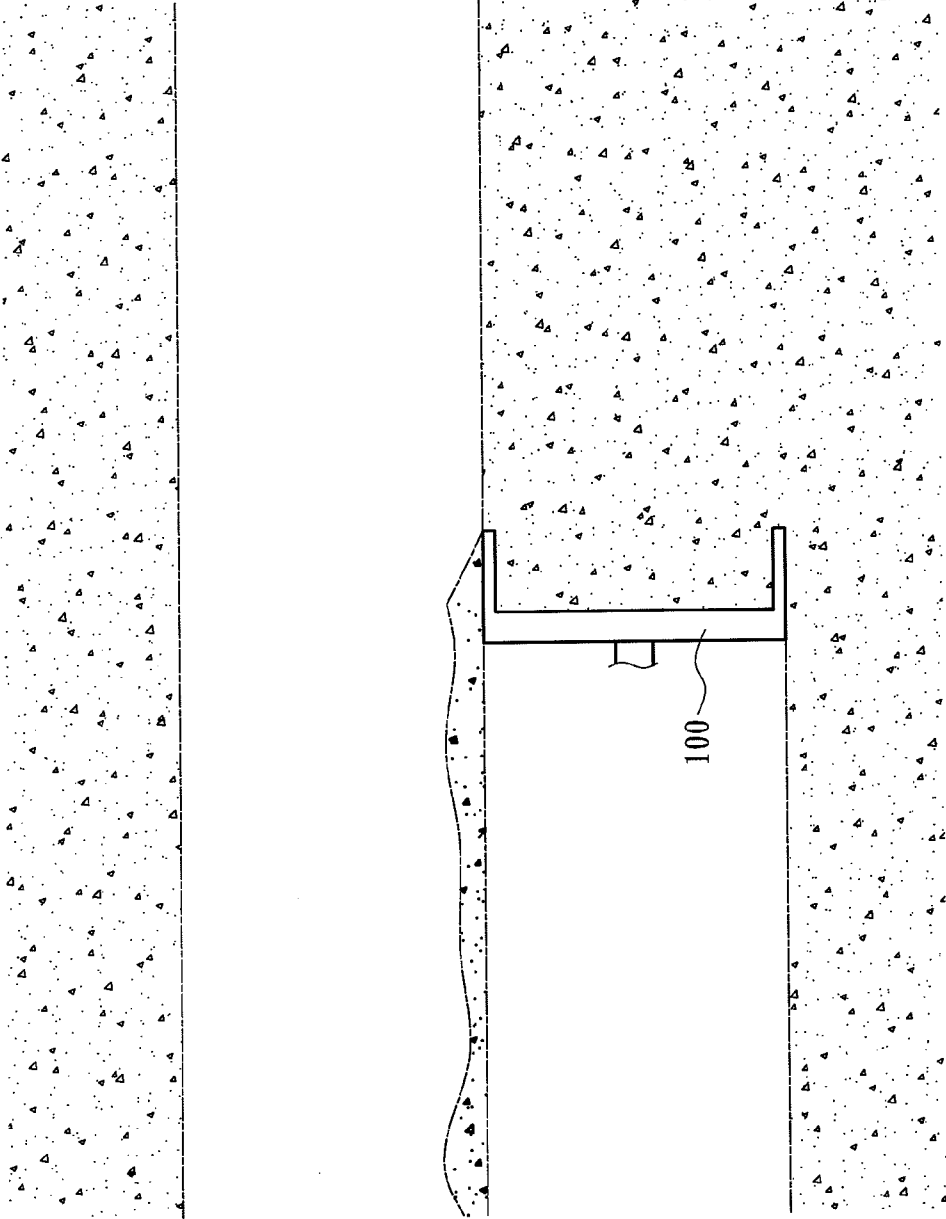


Fig. 1 PRIOR ART

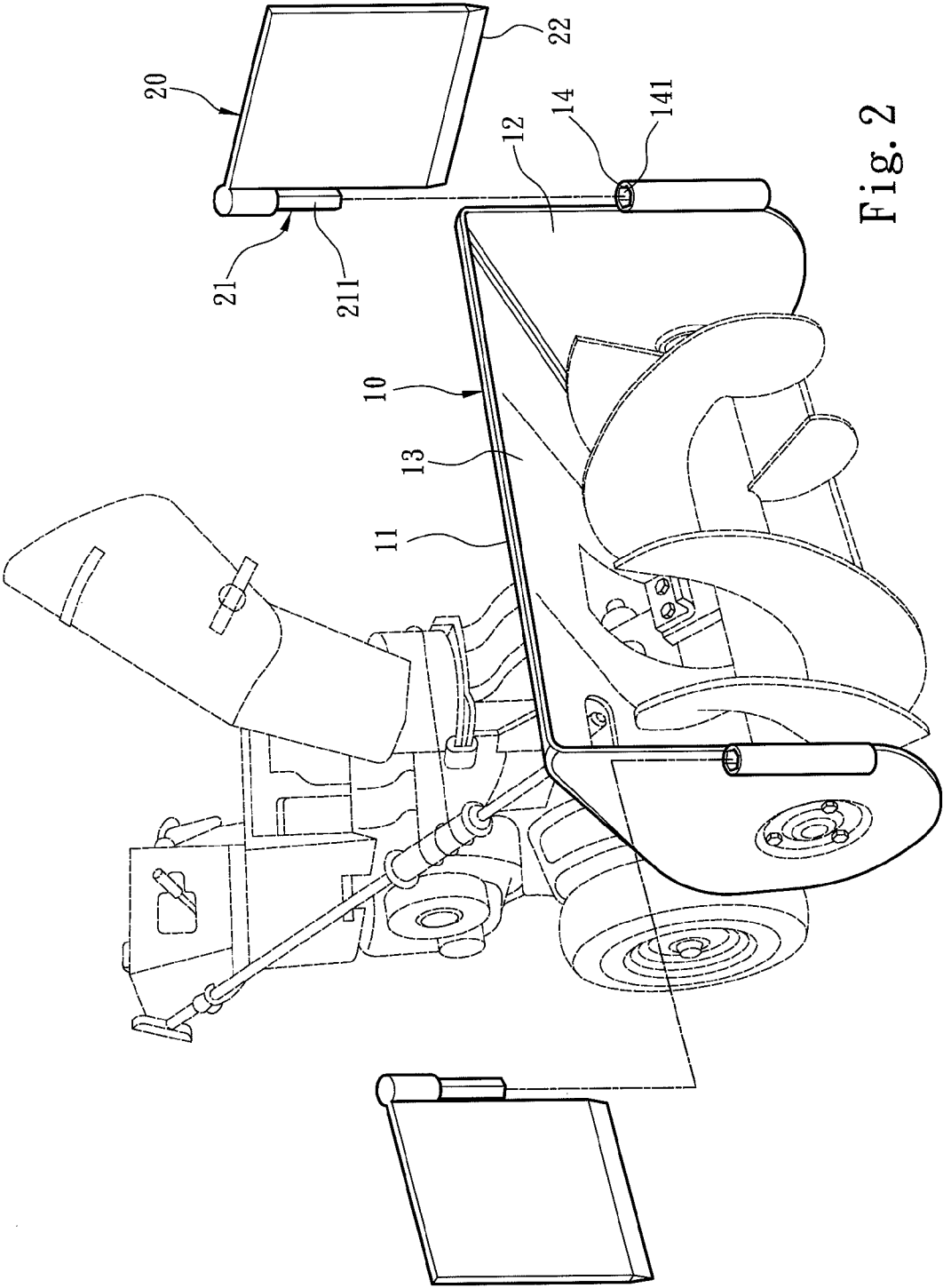


Fig. 2

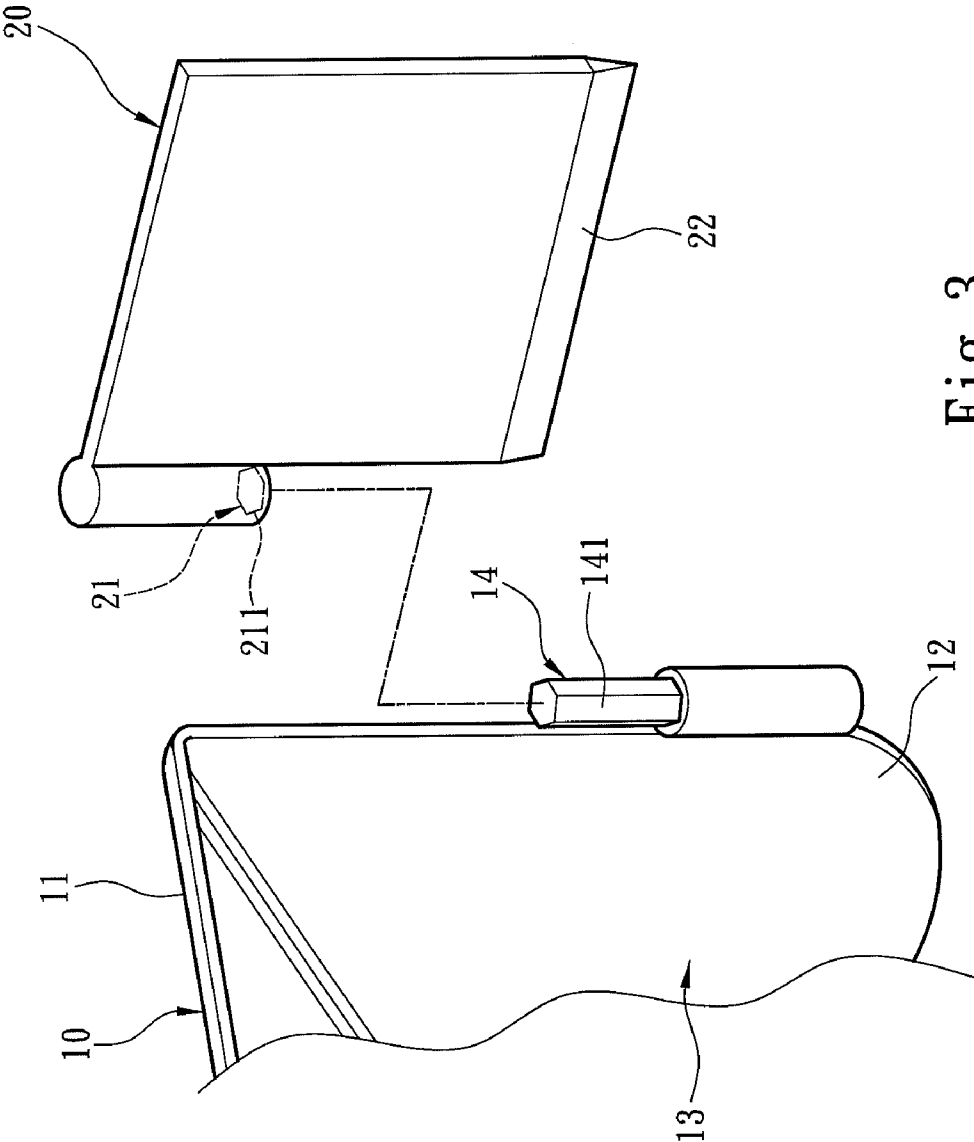


Fig. 3

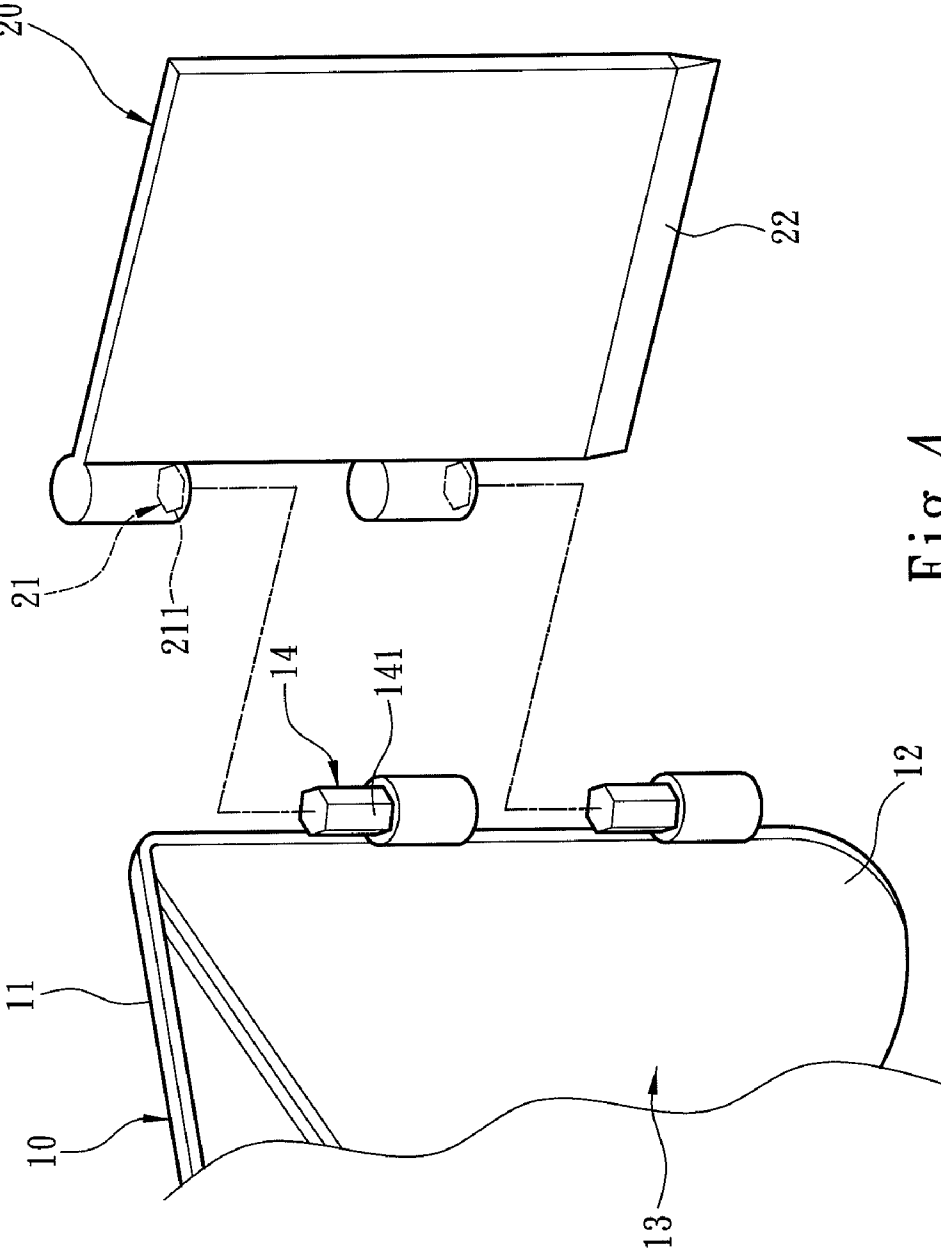


Fig. 4

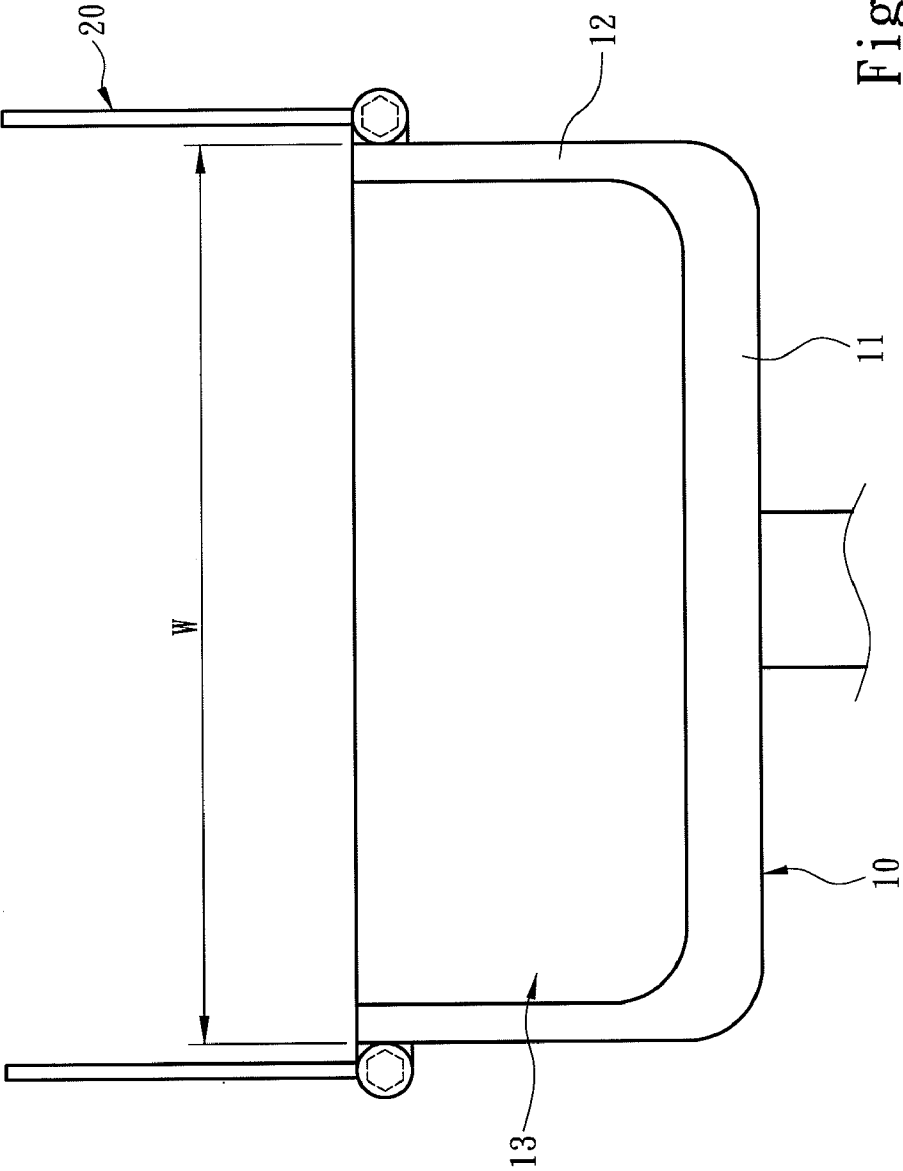


Fig. 5

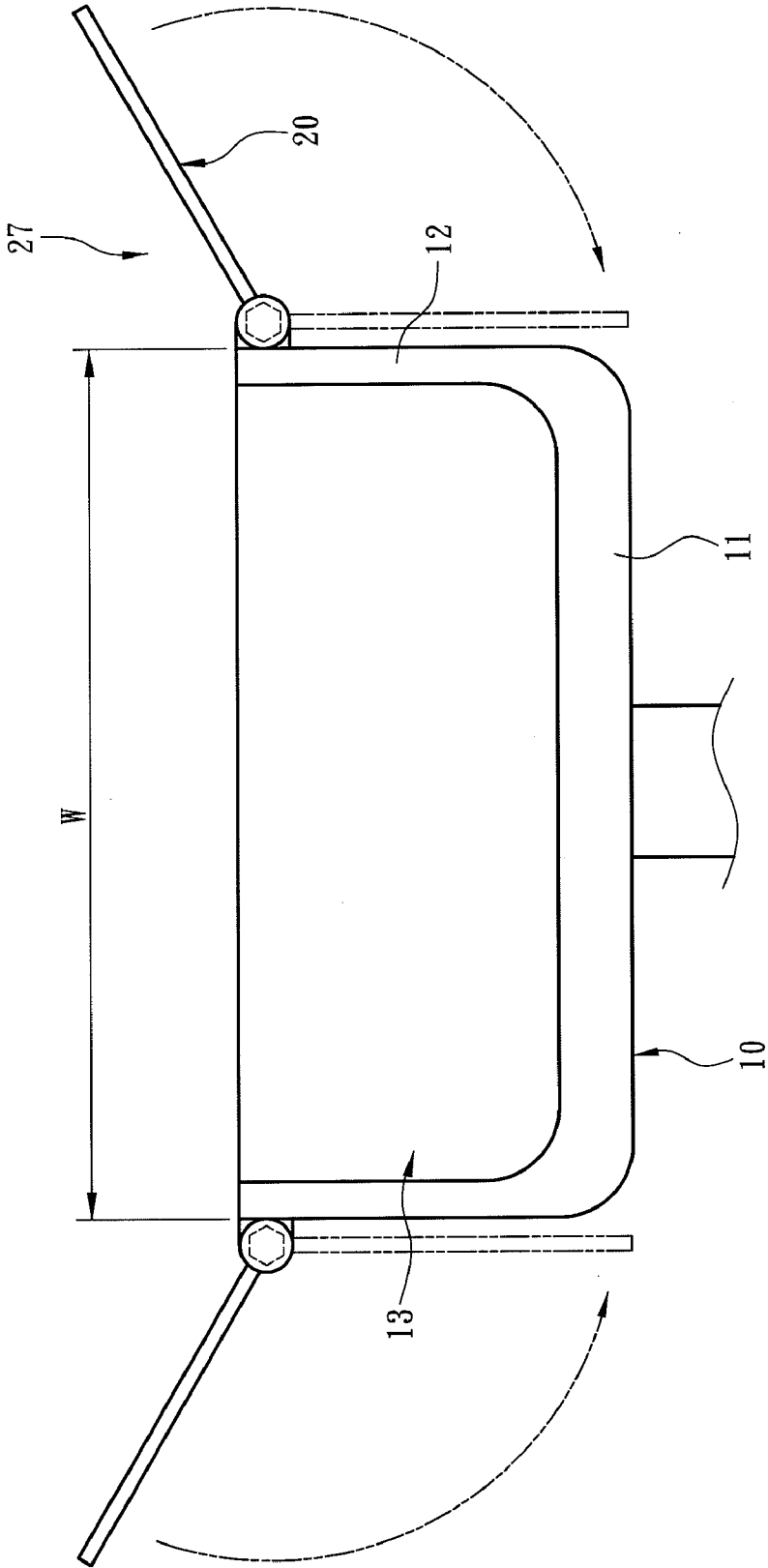


Fig. 6

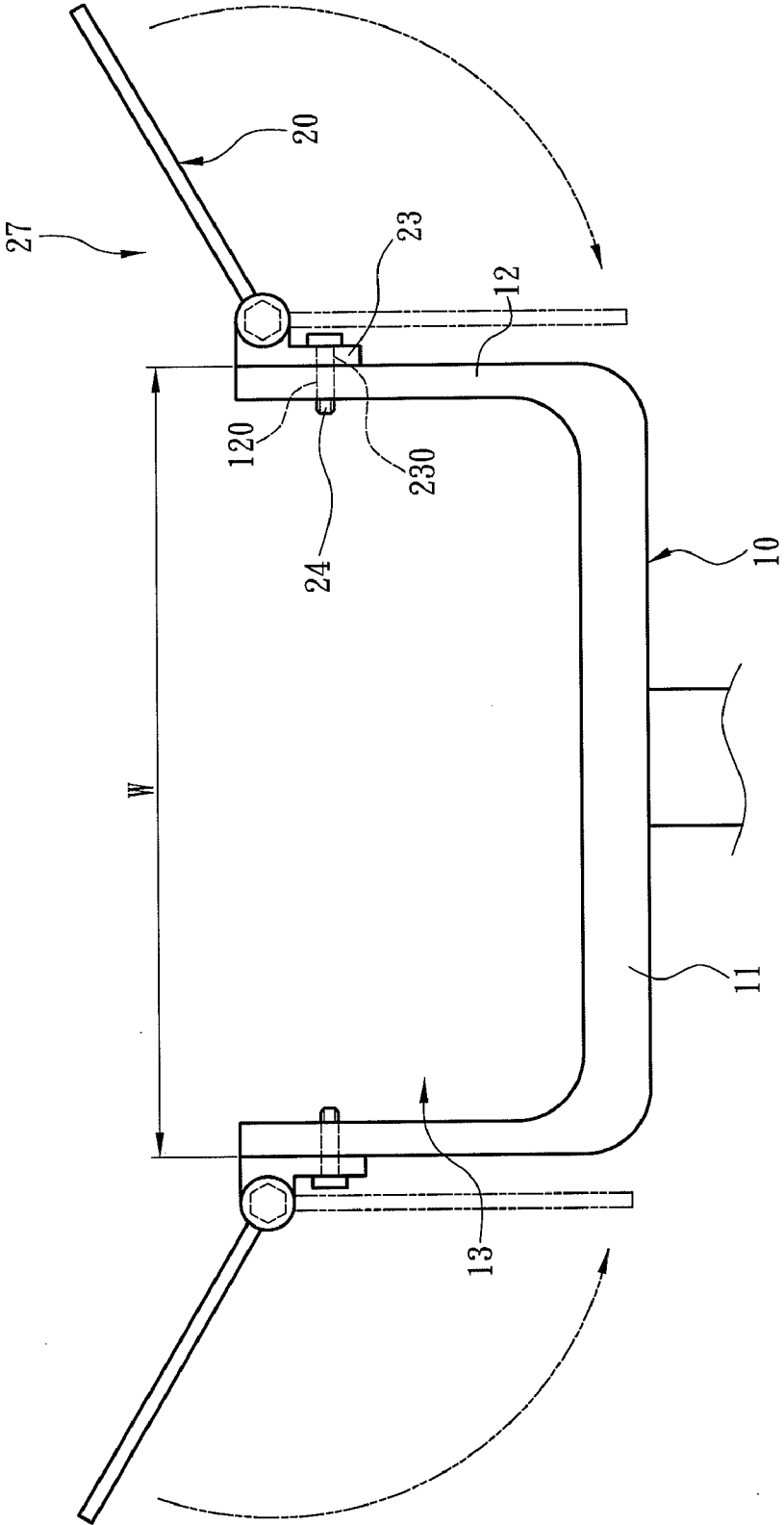


Fig. 7



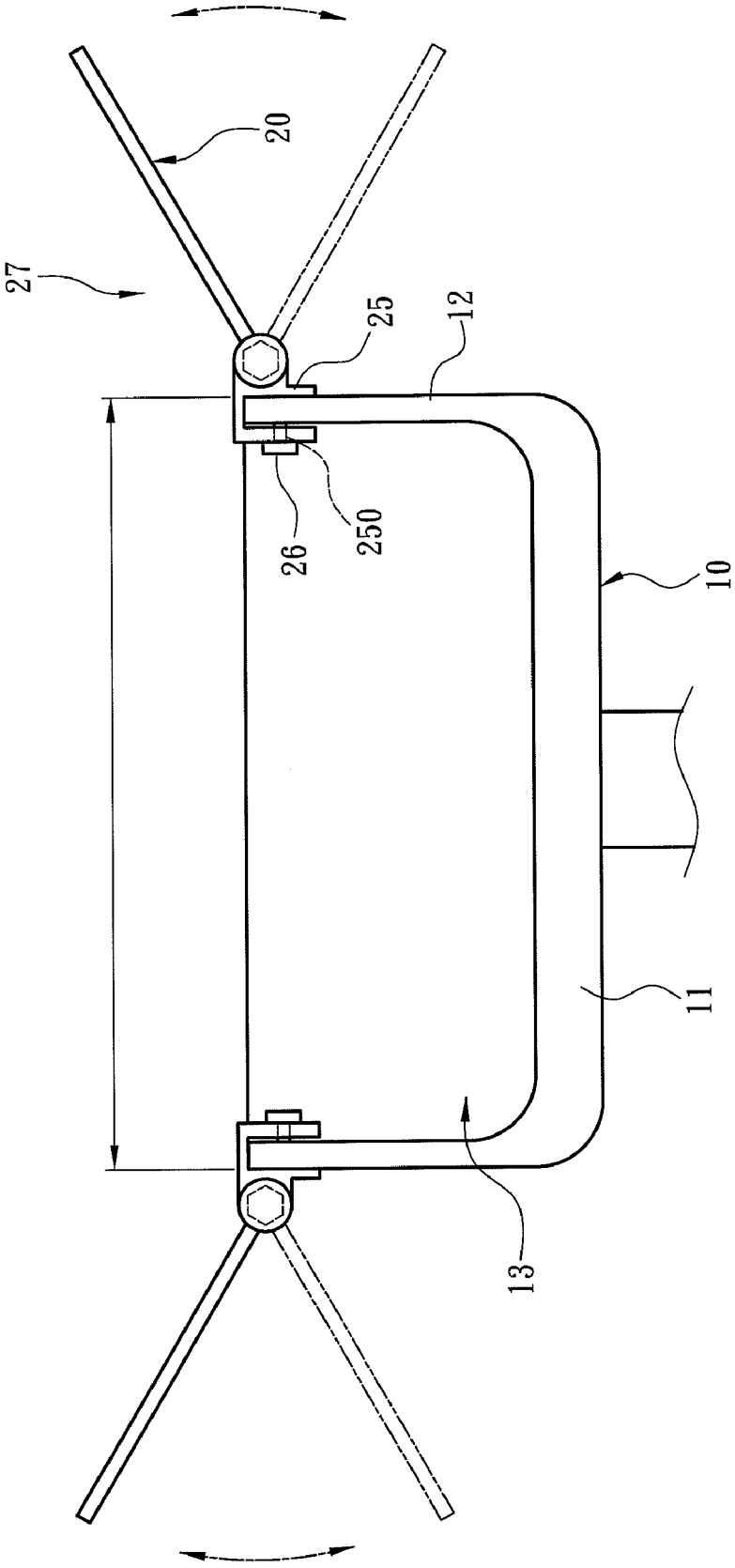


Fig. 8

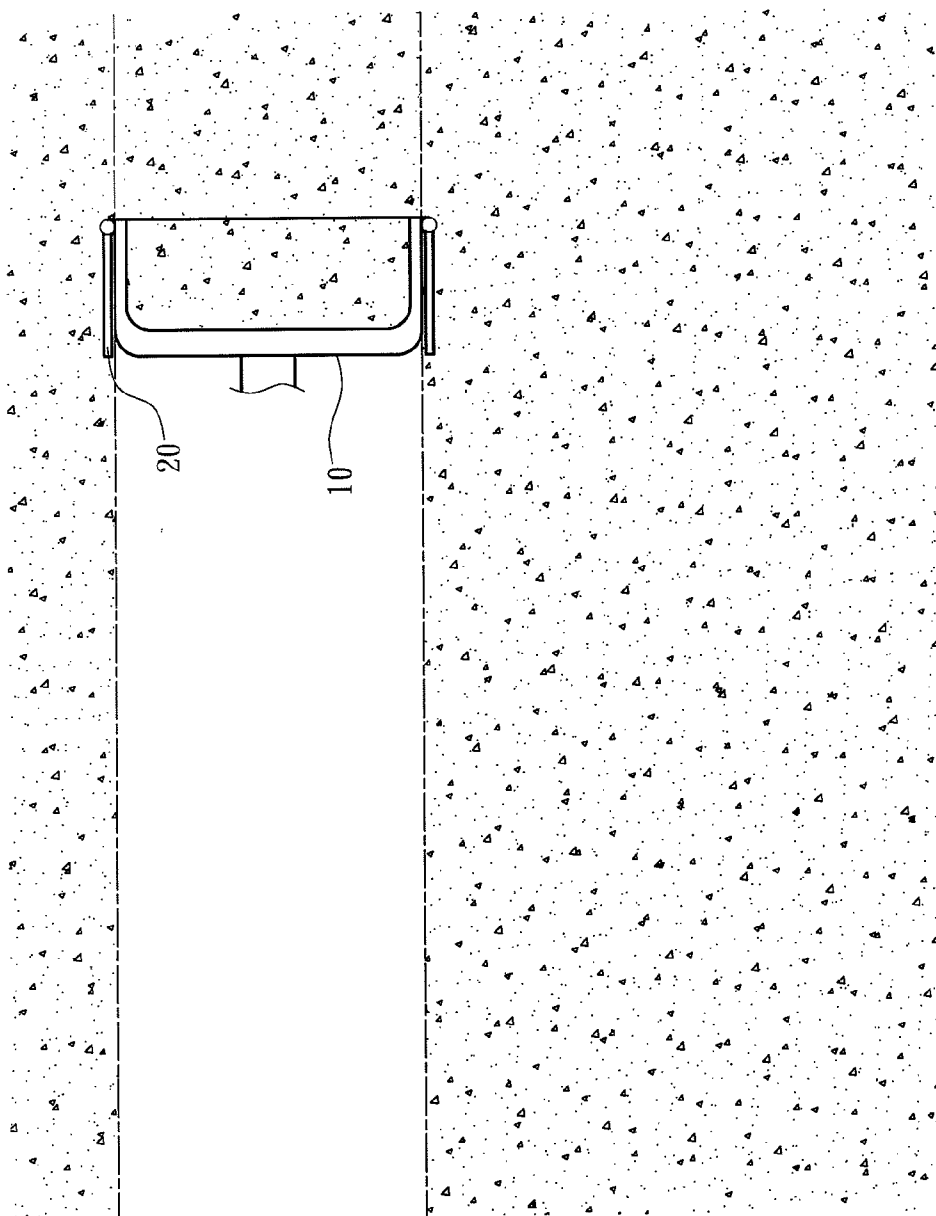


Fig. 9A

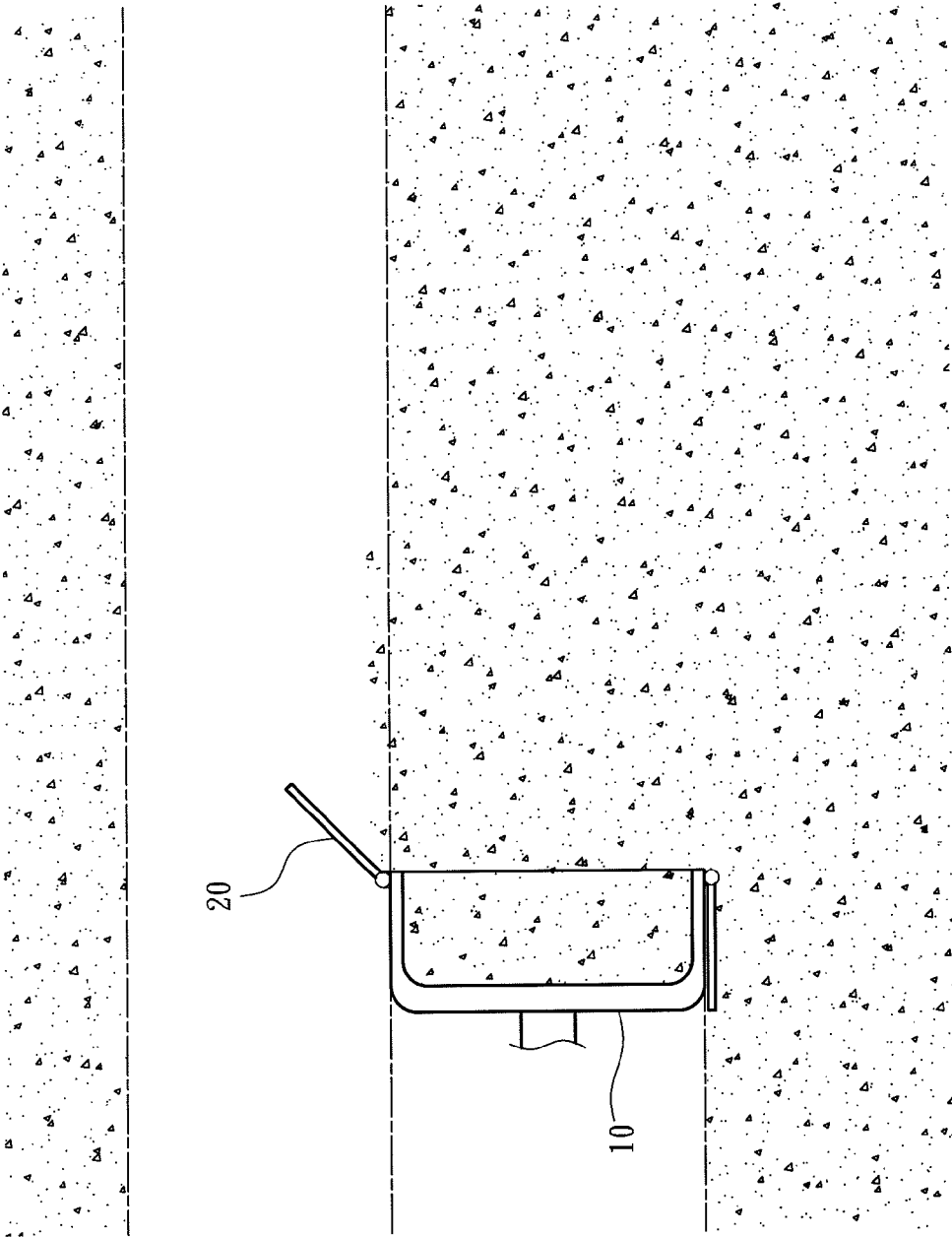


Fig. 9B

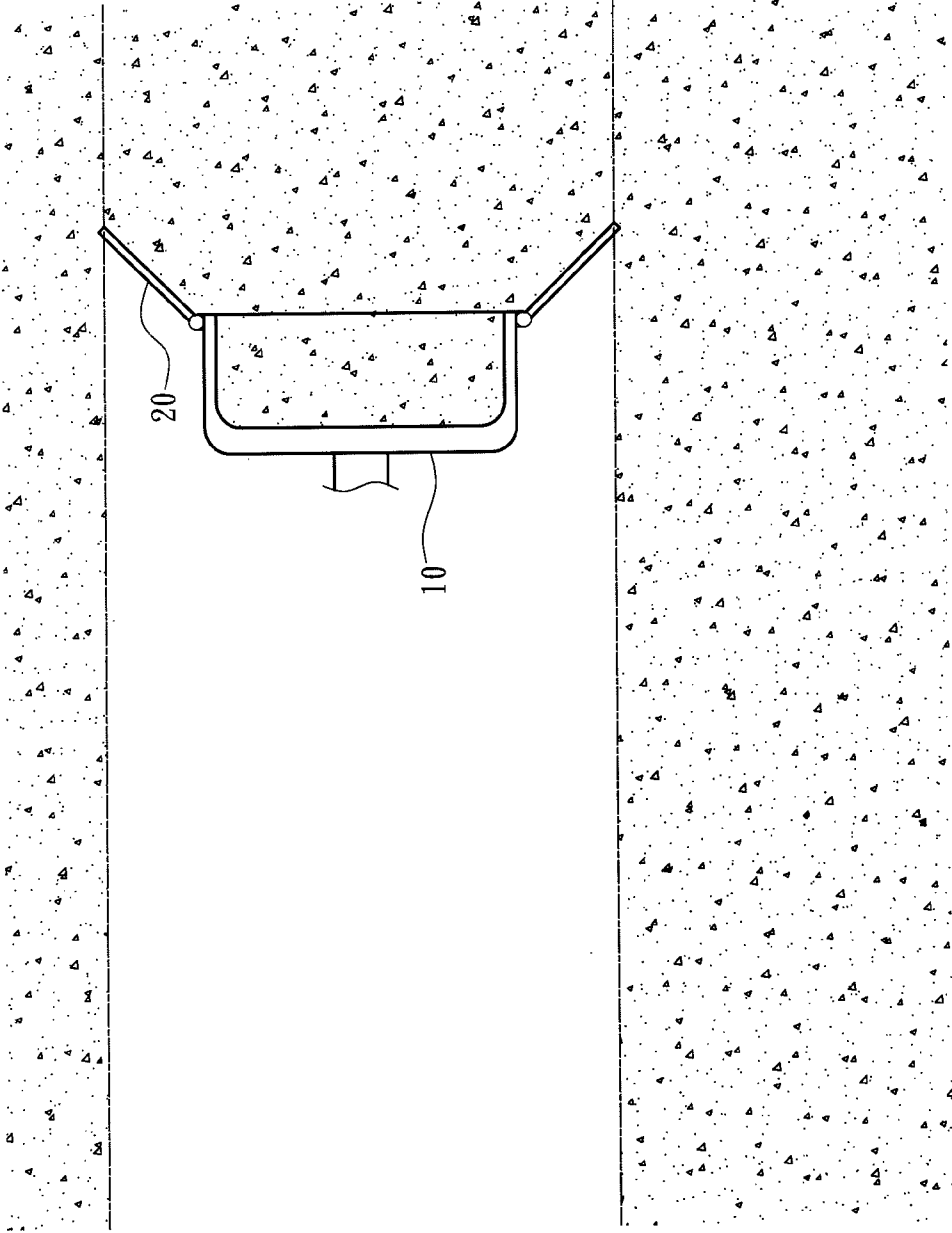


Fig. 10

**REMNANT SNOW REMOVING APPARATUS FOR SNOW THROWERS**

[0001] This application is a continuation-in-part, and claims priority, of from U.S. patent application Ser. No. 12/754,678 filed on Apr. 6, 2010, entitled "REMNANT SNOW REMOVING APPARATUS FOR SNOW THROWERS", the entire contents of which are hereby incorporated by reference.

**FIELD OF THE INVENTION**

[0002] The present invention relates to a remnant snow removing apparatus for snow throwers and particularly to a remnant snow removing structure for household snow throwers to clear remnant snow scattering outside the snow clearing swath.

**BACKGROUND OF THE INVENTION**

[0003] In snowy regions or countries, snow often heaps on the roads, and walkways and driveways of houses, which causes great inconvenience for people going around or in and out of the house. Hence after a heavy snowfall, many people have to clear the accumulated snow on the walkways and driveways to make walking or driving cars possible.

[0004] There are a wide variety of snow throwers disclosed in prior arts, such as U.S. Pat. Nos. 4,062,135, 4,255,879, 4,205,468 and 5,438,770. They commonly have a scraper bucket to hold an auger and connect to an exhaust chute. The auger can feed accumulated snow to the exhaust chute for spouting out. Refer to FIG. 1 for a conventional snow thrower represented by a scraper bucket 100 here, yet the auger and exhaust chute are omitted in the figure to facilitate discussion. In general, after having cleared the accumulated snow in the first swath and when removing the accumulated snow in the second swath is intended, to align one side of the scraper bucket 100 to the edge of the accumulated snow will result in scattering of snow outwards due to the snow at the edge being loose and lacks support, hence remnant snow remains between the first and second swaths.

[0005] The remnant snow becomes ice and makes ground surface wet and slippery after being trodden by pedestrians. People walking thereon could easily fall down. To remedy this problem, a commonly adopted approach is to align the edge of the accumulated snow to the center of the scraper bucket rather than the edge of the scraper bucket so that the scattered snow is located within the clearing range of the scraper bucket and can be scooped up properly. Such an approach makes each clearing swath narrower: more runs and time are needed to clear the snow. Since outdoor temperature often is quite low in the snowing season, to clear snow for a long duration is tiresome for people both physically and mentally. In attempt to shorten snow clearing time by pushing the snow thrower faster often cannot thoroughly clear the accumulated snow on the edge, especially when the pushing speed is too fast and the accumulated snow is too thick.

[0006] U.S. Pat. No. 6,247,254 also discloses a snow thrower which has a scraper bucket, an impeller held therein, and a bracket installed on each of two sides of the scraper bucket. The bracket is hinged with a wing close to the opening of the scraper bucket. The wing and bracket are bridged by a fastening arm to hold the wing at a fixed position. The wing

can be extended to increase snow removing range to make remnant and scattered snow within the removing range of the scraper bucket.

[0007] However, during fabrication of the snow thrower, the wing and fastening arm are fastened to the bracket and installed on the scraper bucket in an integrated manner. For many families already have snow throwers, the wing cannot be installed on the existing snow throwers. They have to purchase extra new snow throwers.

**SUMMARY OF THE INVENTION**

[0008] The primary objective of the present invention is to solve the aforesaid disadvantages by providing a remnant snow removing apparatus that can be simply installed on any type of snow throwers to clear accumulated snow more effectively and thoroughly, and also to save snow clearing effort and increase snow clearing speed.

[0009] To achieve the foregoing objective, the present invention provides a remnant snow removing apparatus that includes a scraper bucket and at least one extension panel fastened to the scraper bucket. The scraper bucket includes a central plate and two side plates at two sides thereof to jointly form a housing compartment to hold accumulated snow. The two side plates are spaced from each other to form a snow clearing swath. The scraper bucket has a first coupling portion. The extension panel has a second coupling portion detachably coupled with the first coupling portion. The extension panel is extended outwards from one side plate and forms an included angle with the side plate to form a remnant snow clearing space outside the snow clearing swath. The first coupling portion has a plurality of first positioning surfaces. The second coupling portion has a plurality of second positioning surfaces latched with the first positioning surfaces to form positioning relationship. The first and second positioning surfaces are formed annularly on the first and second coupling portions in equiangular and polygonal structures. Users can install the extension panel on the scraper bucket by themselves as required, and adjust the included angle between the extension panel and the scraper bucket to form a desired angle through the first and second positioning surfaces.

[0010] In an embodiment of the invention, the first and second coupling portions are respectively a strut and a recess. The scraper bucket can be coupled with a fastening plate having the first coupling portion. The fastening plate and the scraper bucket have respectively a fastening hole corresponding to each other to receive a first fastening element for fastening. The scraper bucket further can be coupled with two clamping plates respectively having the first coupling portion to clamp the scraper bucket. At least one clamping plate has a fastening hole to receive a second fastening element to butt the scraper bucket.

[0011] The foregoing, as well as additional objects, features and advantages of the invention will be more readily apparent from the following detailed description, which proceeds with reference to the accompanying drawings.

**BRIEF DESCRIPTION OF THE DRAWINGS**

[0012] FIG. 1 is a schematic view of a conventional technique to clear snow.

[0013] FIG. 2 is a perspective view of a first embodiment of the invention.

- [0014] FIG. 3 is a perspective view of a second embodiment of the invention.
- [0015] FIG. 4 is a perspective view of a third embodiment of the invention.
- [0016] FIG. 5 is a schematic view of the first embodiment of the invention in a use condition.
- [0017] FIG. 6 is a schematic view of the first embodiment of the invention in another use condition.
- [0018] FIG. 7 is a plane view of a fourth embodiment of the invention.
- [0019] FIG. 8 is a plane view of a fifth embodiment of the invention.
- [0020] FIGS. 9A and 9B are schematic views of the invention in use conditions.
- [0021] FIG. 10 is a schematic view of the invention in another use condition.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0022] Please refer to FIG. 2, the present invention aims to provide a remnant snow removing apparatus for a snow thrower that mainly includes a scraper bucket 10 and at least one extension panel 20 fastened to the scraper bucket 10. The scraper bucket 10 includes a central plate 11 and two side plates 12 located at two sides of the central plate 11 to jointly form a housing compartment 13 there between to hold accumulated snow. The snow thrower also has an auger held in the scraper bucket 10 and an exhaust chute to blow the accumulated snow held in the scraper bucket 10 outside. Each of the side plates 12 has a first coupling portion 14 located thereon. The extension panel 20 has a second coupling portion 21 detachably coupled with the first coupling portion 14. Also referring to FIG. 2, the first coupling portion 14 and second coupling portion 21 can be a strut and a recess that also can be exchanged as shown in FIG. 3 to allow the extension panel 20 and scraper bucket 10 to couple together through insertion. To enhance the coupling firmness of the scraper bucket 10 and extension panel 20, the respective number of the first coupling portion 14 and second coupling portion 21 can be increased as desired. Referring to FIG. 4, the scraper bucket 10 and extension panel 20 respectively has two first coupling portions 14 and two second coupling portions 21. Each of the first coupling portions 14 has a plurality of first positioning surfaces 141, and each of the second coupling portions 21 has a plurality of second positioning surfaces 211 latched with the first positioning surfaces 141 to form positioning relationship between them. The first and second positioning surfaces 141 and 211 are formed annularly on the first and second coupling portions 14 and 21 in equiangular and polygonal structures. In an embodiment of the invention, the extension panel 20 further has a buffer member 22 such as a rubber strip butting the ground surface to prevent the extension panel 20 from being damaged due to rough and uneven ground surface.

[0023] Also referring to FIGS. 5 and 6, the scraper bucket 10 defines a snow clearing swath W through the distance between the two side plates 12. The extension panel 20 is extended from one side plate 12 and forms an included angle with the side plate 12 to form a remnant snow clearing space 27 outside the snow clearing swath W. The included angle can be adjusted through adjusting the mutual latched position of the first and second positioning surfaces 141 and 211 of the first and second coupling portions 14 and 21. Thus forms the main structure of the invention.

[0024] Aside from the previous embodiment of fixedly fastening the first coupling portion 14 to the side plate 12, such as by soldering, FIG. 7 depicts another embodiment in which a fastening plate 23 is provided and coupled with the side plate 12 of the scraper bucket 10. The first coupling portion 14 is fastened to the fastening plate 23. The fastening plate 23 and the scraper bucket 10 have respectively a fastening hole 230 and 120 corresponding to each other to receive a first fastening element 24 for fastening. FIG. 8 shows yet another embodiment in which each of the side plates 12 is sandwiched by two clamping plates 25 to clamp the scraper bucket 10, and the first coupling portion 14 is fastened to the two clamping plates 25. At least one clamping plate 25 has a fastening hole 250 run through by a second fastening element 26 to butt the scraper bucket 10. Thus the extension panel 20 can be installed on the scraper bucket 10 through extra fastening components, such as the aforesaid fastening plate 23 and clamping plates 25, without changing the structure of the scraper bucket 10 to clear remnant snow.

[0025] Please refer to FIGS. 9A and 9B for the first embodiment in use conditions. During snow clearing operation, first, move the extension panels 20 at two sides close to the scraper bucket 10 in a folding condition to clear accumulated snow in the first swath. To clear the accumulated snow for the second swath, change the angle of the extension panel 20 at one side to an open condition to form the remnant snow clearing space 27 outside the snow clearing swath W, then align the side plate 12 of the scraper bucket 10 to the edge of the accumulated snow and move forwards to clear the accumulated snow in the second swath. Due to the accumulated snow at the edge is loose without much support, it scatters outwards and can be cleared through the remnant snow clearing space 27 formed outside the snow clearing swath W of the extension panel 20. Referring to FIG. 10, in the event that the snow is accumulated at a thinner thickness, the extension panels 20 at two sides of the scraper bucket 10 can be opened to increase snow clearing range to quickly clear the accumulated snow.

[0026] As a conclusion, the invention mainly provides a first coupling portion 14 and second coupling portion 21 respectively and detachably on the scraper bucket 10 and extension panel 20 that can be assembled and disassembled by users as required. Moreover, the first and second coupling portions 14 and 21 have respectively a plurality of first positioning surfaces 141 and second positioning surfaces 211 that are latched for positioning and formed annularly on the first and second coupling portions 14 and 21 in equiangular and polygonal structures. Therefore, when the extension panel 20 is installed on the scraper bucket 10, the included angle between them can be adjusted and fixed through the first and second positioning surfaces 141 and 211.

What is claimed is:

1. A remnant snow removing apparatus for a snow thrower, comprising:
  - a scraper bucket including a central plate, two side plates at two sides of the central plate to jointly form a housing compartment there between to hold accumulated snow, and a first coupling portion, the two side plates being spaced from each other to define a snow clearing swath; and
  - at least one extension panel which includes a second coupling portion detachably coupled with the first coupling portion, the extension panel being extended from one

side plate to form an included angle with the side plate to form a remnant snow clearing space outside the snow clearing swath;

wherein the first coupling portion includes a plurality of first positioning surfaces and the second coupling portion includes a plurality of second positioning surfaces latched with the first positioning surfaces to form positioning relationship, the first and second positioning surfaces being formed annularly on the first and second coupling portions in equiangular and polygonal structures.

2. The remnant snow removing apparatus of claim 1, wherein the first coupling portion and the second coupling portion are respectively a strut and a recess.

3. The remnant snow removing apparatus of claim 1, wherein the first coupling portion and the second coupling portion are respectively a recess and a strut.

4. The remnant snow removing apparatus of claim 1, wherein the scraper bucket is coupled with a fastening plate,

the first coupling portion being fastened to the fastening plate, the fastening plate and the scraper bucket including respectively a fastening hole corresponding to each other to receive a first fastening element for securing.

5. The remnant snow removing apparatus of claim 1, wherein the scraper bucket is sandwiched by two clamping plates to clamp the scraper bucket, the first coupling portion being fastened to the two clamping plates.

6. The remnant snow removing apparatus of claim 5, wherein at least one clamping plate including a fastening hole run through by a second fastening element to butt the scraper bucket.

7. The remnant snow removing apparatus of claim 1, wherein the extension panel includes a buffer member butting the ground surface.

8. The remnant snow removing apparatus of claim 7, wherein the buffer member is a rubber stripe.

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