United States Patent [19]

Bombardier

[11] **3,786,886**

[45] **Jan. 22, 1974**

[54] **BRACKET ASSEMBLY FOR SNOWMOBILE SKIS**

[75] Inventor: **Jerome Bombardier,** Valcourt, Quebec, Canada

[73] Assignee: **Bombardier Limited,** Valcourt, Quebec, Canada

[22] Filed: **Dec. 20, 1972**

[21] Appl. No.: **316,727**

[52] **U.S. Cl.** ..... **180/5 R,** 267/56, 280/25

[51] **Int. Cl.** **B62b 17/04**

[58] **Field of Search** ..... 180/3–6; 280/25; 267/56, 55, 54 R

[56] **References Cited**

UNITED STATES PATENTS

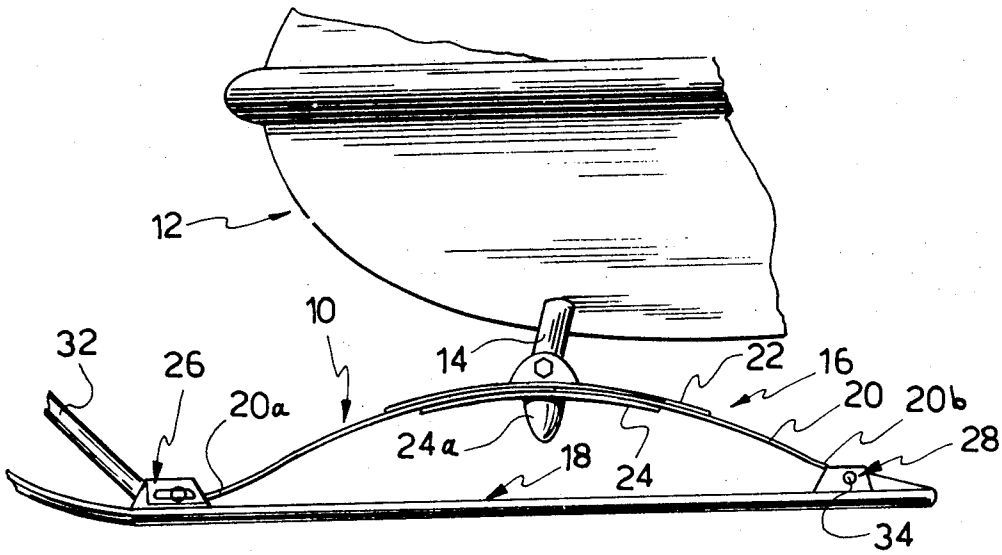
2,002,632	5/1935	Gilpin	267/56 X
3,707,297	12/1972	Perreault	180/5 R
3,257,123	6/1966	Giovinazzo	267/56 X
1,580,540	4/1926	Shay	267/56
1,623,651	4/1927	Ayres	267/56

Primary Examiner—Richard J. Johnson
Attorney, Agent, or Firm—Roberts B. Larson et al.

[57] **ABSTRACT**

A bracket assembly is mounted on a snowmobile ski runner for slidingly receiving one end of the main leaf of a leaf spring unit and includes: a retaining pin extending connected to the said one end; a sliding block defining a housing for receiving the said one end therein and having opposite side walls with aligned openings for receiving the retaining pin therethrough; and a cover fixed to the ski runner and having an open end for slidingly receiving the block therein, opposite side walls of the cover having longitudinally extending aligned slots allowing the opposite ends of the retaining pin to move freely relative to the cover. In a preferred form, the block is made of plastic material and is constructed to avoid direct contact between the retaining pin and the cover thereby greatly reducing wear and breakage of the parts.

6 Claims, 5 Drawing Figures



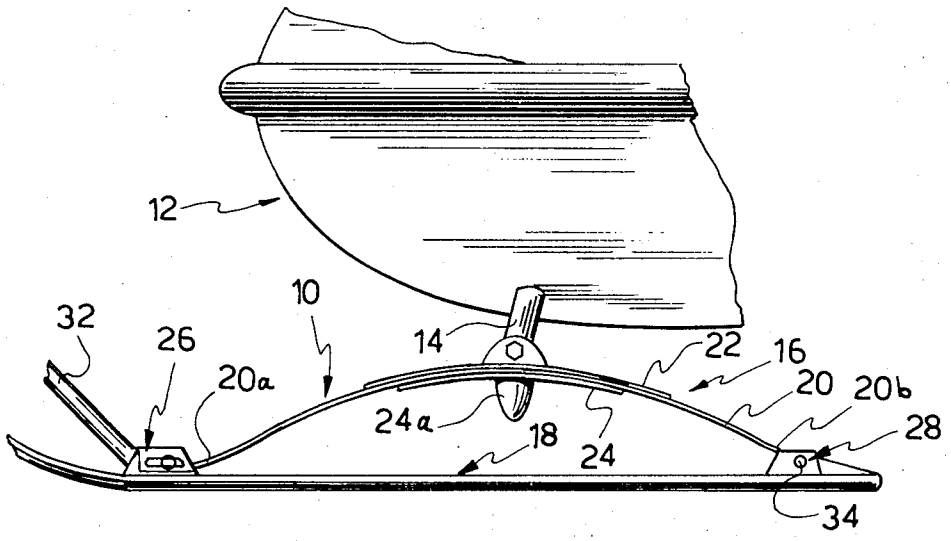

12
10
32
26
20a
14
22
16
20
20b
28
24a
18
24
34

FIG.1

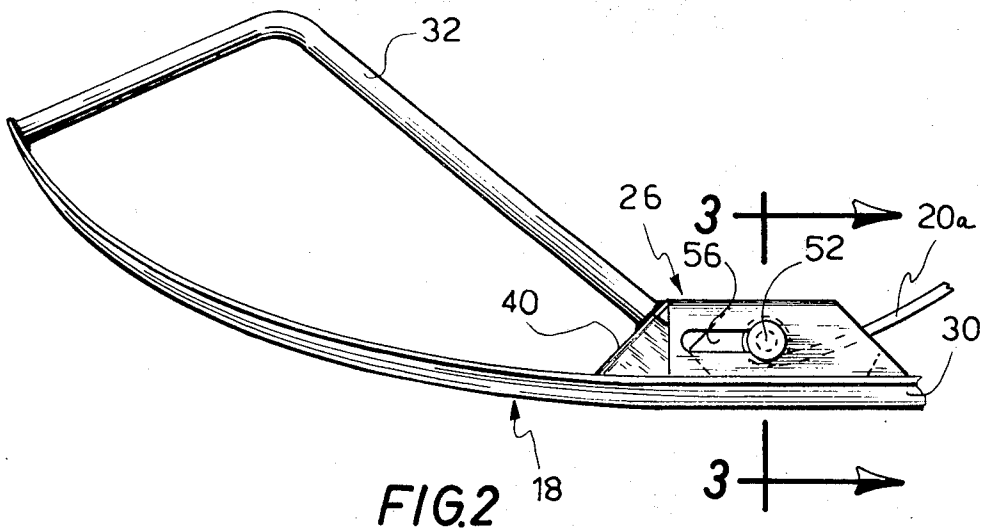

32
26
3
20a
56
52
40
30
18
3

FIG.2

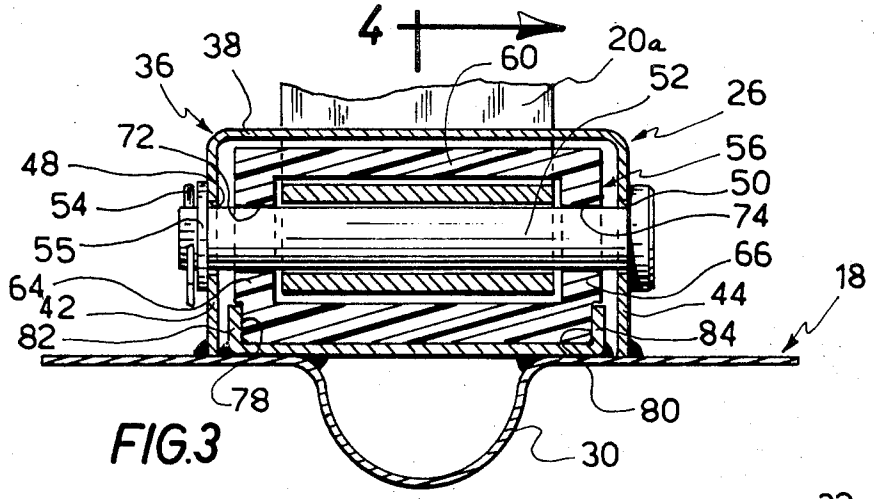


FIG.3

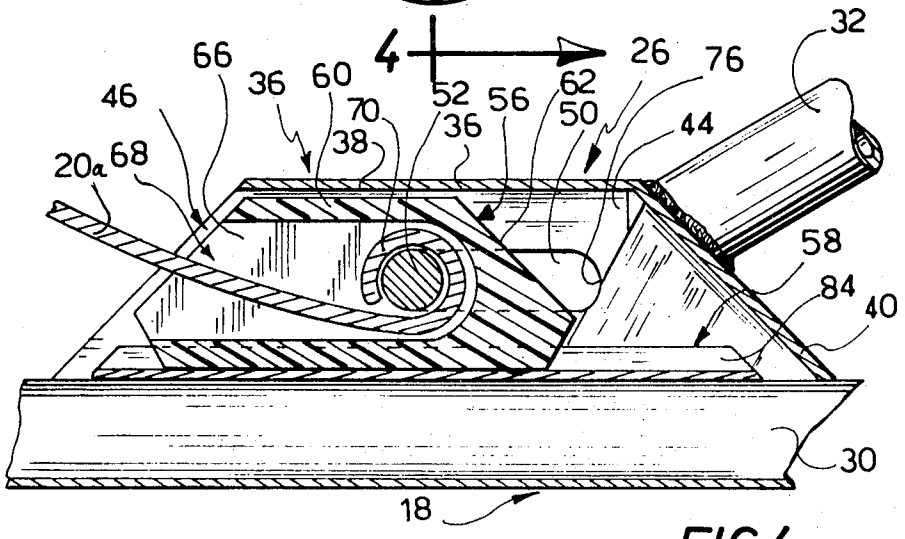


FIG.4

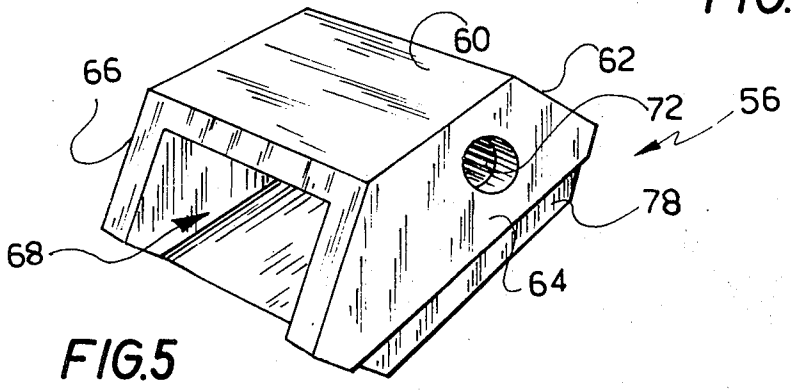


FIG.5

BRACKET ASSEMBLY FOR SNOWMOBILE SKIS

This invention relates generally to snowmobile skis and, more particularly, to a bracket assembly for slidingly confining one end of the main leaf of the leaf spring unit of the ski assembly.

The connection of the leaf spring unit to the ski runner consists of a pair of longitudinally spaced bracket assemblies secured to the top surface of the ski runner. Generally, the rear end of the main leaf is fixed to one bracket while the front end is slidingly received in a second bracket in such a way as to allow elongation of the leaf upon depression thereof. This second bracket usually includes a transversely extending retaining pin fixed to the opposite side walls of a cover and under which the end of the leaf is allowed to slide.

One disadvantage of such bracket construction is that all components, being metallic, wear rapidly resulting in frequent breakage of the parts.

It is an object of the present invention to provide a bracket assembly which overcomes the above disadvantage and improves the connection between the leaf spring unit and the ski runner. The invention consists in providing within the bracket assembly a sliding block, preferably made of plastic material, which slides with the elongation of the leaf and which is constructed so as to considerably reduce wear between the components.

The present invention therefore relates to a bracket assembly mounted on a snowmobile ski runner for slidingly receiving one end of the main leaf of a leaf spring unit, which bracket assembly comprises: in combination, a retaining pin means extending transversely of the ski runner and connected to the said end; a sliding block means having top and opposite side walls defining a first housing receiving therein the said end of the leaf, the opposite side walls having aligned openings receiving the retaining pin means therethrough; and a cover means fixedly mounted to the ski runner and having top and opposite side walls defining a second housing slidingly receiving therein the sliding block means, the side walls of the cover means having longitudinally extending aligned slots receiving the retaining pin means therethrough and allowing the pin means to move freely relative to the cover means.

In a preferred form of the invention, the retaining pin means is supported in the openings of the side walls of the block means; the elongated slots of the cover means have a larger opening than that of the side walls of the block means whereby there is no frictional contact between the retaining pin means and the side walls of the cover means.

Other objects, purposes and characteristic features of the present invention will be in part obvious from the accompanying drawings and in part pointed out as the description of the invention progresses.

In describing the invention in detail, reference will be made to the accompanying drawings, in which like reference characters refer to corresponding parts throughout the several views, and in which:

FIG. 1 is an enlarged elevational view of the front end of a snowmobile showing part of the snowmobile body and part of the snowmobile ski assembly;

FIG. 2 is a further enlarged elevational view of the bracket assembly made in accordance with the present invention;

FIG. 3 is a cross-sectional view taken along lines 3 — 3 of FIG. 2;

FIG. 4 is a cross-sectional view taken along lines 4 — 4 of FIG. 3; and

FIG. 5 is a top perspective view of the block means made in accordance with the present invention.

Referring to FIG. 1 of the drawings, there is shown a ski assembly **10** which is adapted to be mounted underneath the front end of a snowmobile body **12** to provide the steering movement of the snowmobile. The ski assembly **10** is pivotally mounted at the lower end of a ski leg **14** linked to the steering column (not shown) of the vehicle. There are usually two of these assemblies mounted in laterally spaced relation supporting the front end of the snowmobile body; however, some snowmobiles are steered with only one ski, centrally disposed at the front thereof. In addition to providing steering of the vehicle, these ski assemblies also serve to absorb the shock imparted to the front end of the vehicle.

Generally, the ski assembly **10** consists of a leaf spring unit **16** longitudinally extending over a ski runner **18.** The leaf spring unit **16** is arched semi-elliptically and includes at least a main leaf **20.** Such leaf spring unit **16** might also include one or more reinforcing leaves such as shown as part **22** in FIG. **1** and a rubber travel stop bumper **24***a* bonded or otherwise fixed on a short leaf **24.** Main spring leaf **20** is full length and has its opposite front and rear ends **20***a* and **20***b* respectively received in bracket assemblies **26** and **28.** In most snowmobiles, the rear end **20**b of the main leaf **20** is curved into a sleeve (not shown) which surrounds a transversely extending retaining pin **34** fixed between the side walls of the rear bracket assembly **28.** An example of such bracket assemblies may be found in applicant's copending Canadian application Ser. No. 097,634 filed Nov. 6, 1970. As mentioned above, the type of front bracket used has many disadvantages.

The present invention provides a novel bracket assembly **26** which comprises a cover **36,** usually made of metal and having a top wall **38,** an inclined front wall **40** (to which is welded a bent pull bar **32**) and a pair of opposite straight side walls **42** and **44.** Cover **36** is fixedly secured, such as by welding, to the top face of the ski runner **18** which also has a downward central portion **30** to which is mounted generally a skate (not shown). The opposite side walls **42** and **44** of the cover are respectively provided with aligned elongated slots **48** and **50** extending in the longitudinal direction of the ski. The rearmost edges of the top and side walls define an open end **46** to receive the front end **20***a* of the main leaf **20.**

Confined within the housing of the cover **36** to allow displacement of front end **20***a* therein as a result of elongation of main leaf spring **20** upon depression thereof, is a hollow block **56** made of plastic material, such as polyethylene, and adapted to slide on a plate **58** fixedly secured to the top face of the ski runner **18.** The block **56** includes a top wall **60,** an inclined front wall **62** and a pair of opposite straight side walls **64** and **66.** The block **56** further includes an open end **68** to receive the rounded extremity **70** of the main leaf **20.** Side walls **64** and **66** of the block **56** are respectively provided with aligned circular openings **72, 74.**

A retaining pin **52** extends transversely of the bracket assembly and protrudes through slot **50,** opening **74,** rounded extremity **70,** opening **72** and slot **48.** The pin

is held in this arrangement by means of a cotter pin **54** and washer **55.**

In a preferred form of the invention, the vertical opening of slots **48** and **50** of the cover is slightly greater than the diameter of openings **72** and **74** of the block whereby the retaining pin **52** is supported only by the side walls of the block and contact between pin **52** and the side walls of the cover is avoided.

In another preferred form of the invention, the front wall **62** of the block **56** is shaped to correspond to the inner face of the front wall **40** of the cover and is constructed with a certain thickness so that it prevents pin **52** from reaching the front extremities of the slots, such as extremity **76** of slot **50** in FIG. **4,** again avoiding direct contact between the pin and the cover which are both made of metal.

In another form of the invention, the lower edge of each side wall **64, 66** of the block has a groove **78, 80** to receive correspondingly-shaped flange portions **82, 84** on opposite sides of the plate **58** thereby allowing proper sliding and guiding movement of the block inside the housing of cover **36.**

The assembly of bracket **26** on the ski runner is simple. First, plate **58** and cover **36** are welded onto the top face of ski runner **18.** Then, block **56** is slidingly positioned inside cover **36** between the flange portions **82** and **84** of plate **58.** The end portion **20a** of the leaf spring **20** is inserted through the open end **68** of the block. Then, the retaining pin **52** is inserted through openings **50, 74, 72** and **48** thereof and is held in place by cotter pin **54.** Hence, the leaf spring **20** is connected to the ski runner and, upon depression of the leaf spring, the block **56** slides on plate **58.** The travel of block **56** on plate **58** terminates with the termination of the depression or by front wall **62** of the block contacting the inclined front wall of the cover or any other means which could be provided inside the cover to stop the displacement of the block therein.

Although the invention has been described above in relation to specific forms of the invention, it will be evident to the man skilled in the art that it may be refined and modified in various ways. It is therefore wished to have it understood that the present invention is not limited in interpretation except by the terms of the following claims.

I claim:

1. In a snowmobile having a ski assembly pivotally attached to the front end thereof and including a ski runner and a leaf spring unit, a bracket assembly for slidingly receiving on said ski runner one end of a leaf of said spring leaf unit, the other end being fixed to said ski runner, comprising: in combination, a retaining pin means extending transversely of the ski runner and connected to said one end of said spring leaf; a sliding block means having top and opposite side walls defining a first housing receiving said one end of said leaf therein, said opposite side walls having aligned openings receiving said retaining pin means therethrough; and a cover means fixedly mounted to the ski runner and having top and opposite side walls defining a second housing for slidingly receiving therein said sliding block means, said side walls of said cover means being provided with longitudinally extending aligned slots receiving said retaining pin means therethrough and allowing said retaining pin means to move freely relative to said cover means.

2. In a snowmobile as defined in claim **1** wherein the aligned slots of said cover means have a vertical opening greater than that of said openings of said sliding block means whereby said retaining pin means is supported by said side walls of said block means thereby avoiding frictional contact with the side walls of said cover means.

3. In a snowmobile as defined in claim **1** wherein said cover means includes a front wall and wherein said block means includes a correspondingly-shaped front wall; said front wall of said block means being constructed to contact said front wall of said cover means prior to said pin means from contacting said side walls of said cover means when said leaf is depressed.

4. In a snowmobile as defined in claim **1** further comprising a sliding plate means fixed to the ski runner within the side walls of said cover means and slidingly receiving said block means thereon.

5. In a snowmobile as defined in claim **4,** wherein said sliding plate means includes guiding flange means cooperating with longitudinal grooves in the side walls of said block means for guiding said block means when sliding.

6. In a snowmobile as defined in claim **1** wherein said block means are made of plastic material.

* * * * *

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,786,886 Dated January 22, 1974

Inventor(s) Jerome Bombardier

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

On the cover sheet the following should be added:

-- [30] Foreign Application Priority Data

Dec. 15, 1972 Canada 159,143 --.

Signed and sealed this 3rd day of September 1974.

(SEAL)
Attest:

McCOY M. GIBSON, JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents

FORM PO-1050 (10-69)

USCOMM-DC 60376-P69
* U.S. GOVERNMENT PRINTING OFFICE : 1969 O—366-334.