March 1, 1966 G. E. BELL ET AL 3,237,982

CONVERTIBLE DUST BOOT SECURING AND TENSING MEANS

Filed Dec. 24, 1963 2 Sheets-Sheet 1

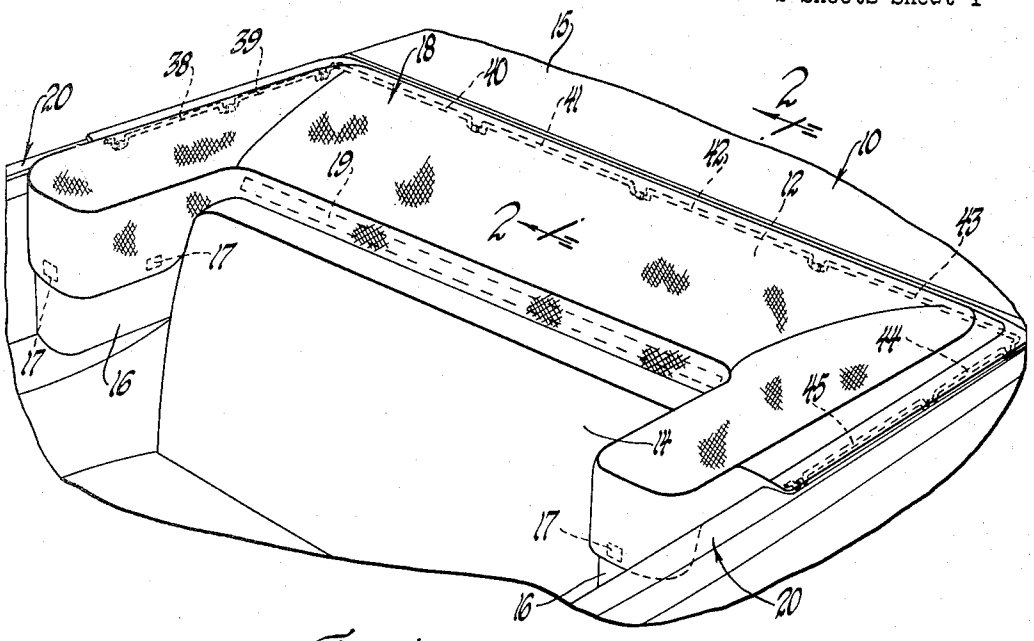


Fig. 1

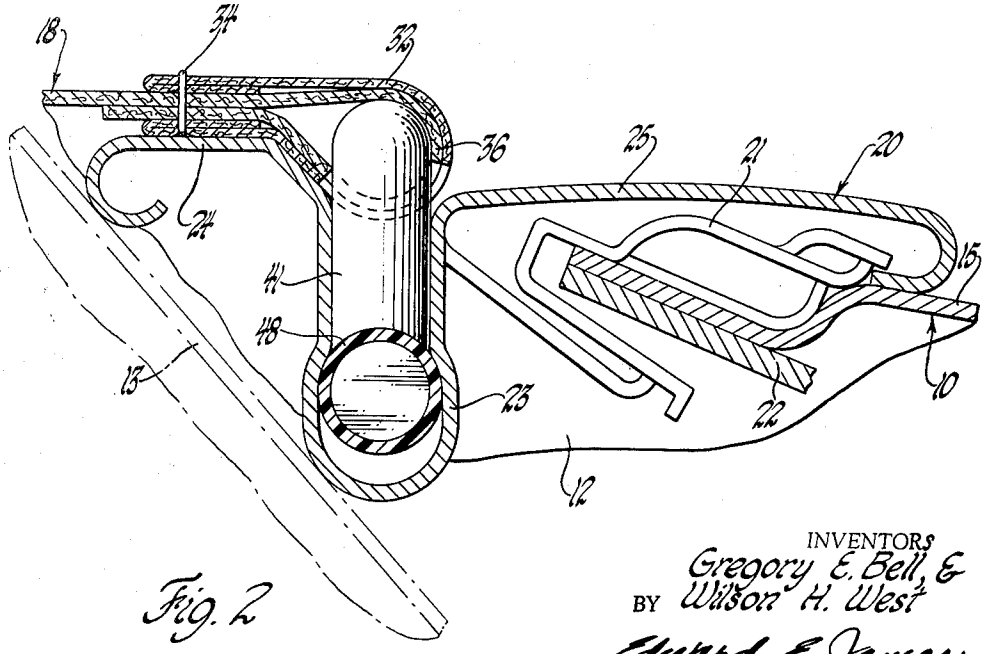


Fig. 2

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CONVERTIBLE DUST BOOT SECURING AND TENSING MEANS

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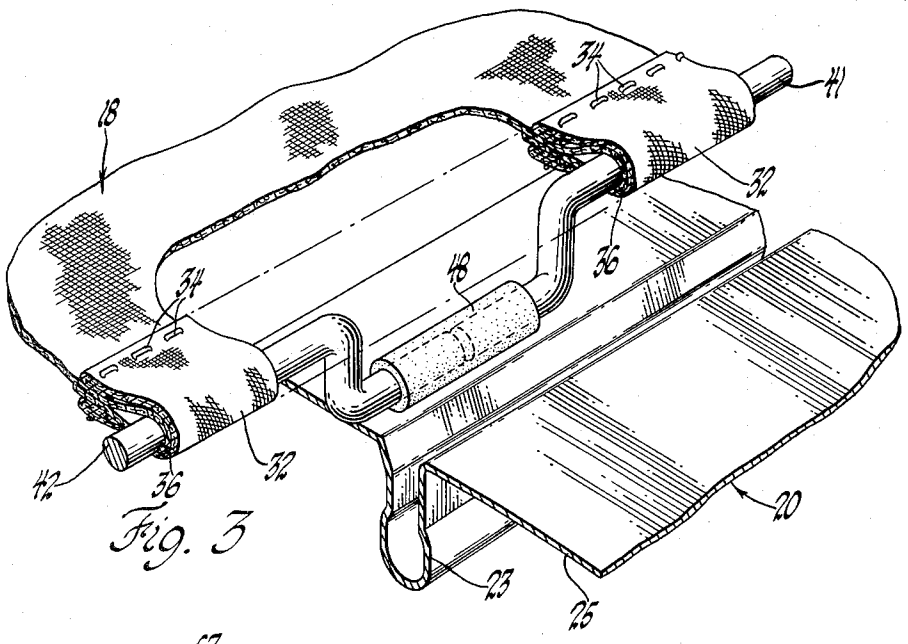


Fig. 3

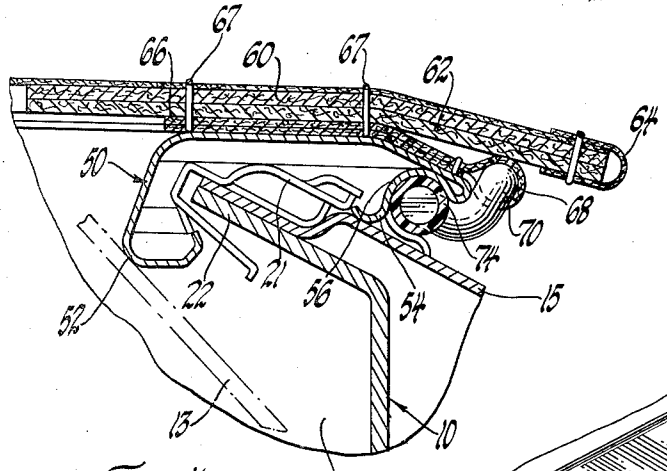


Fig. 4

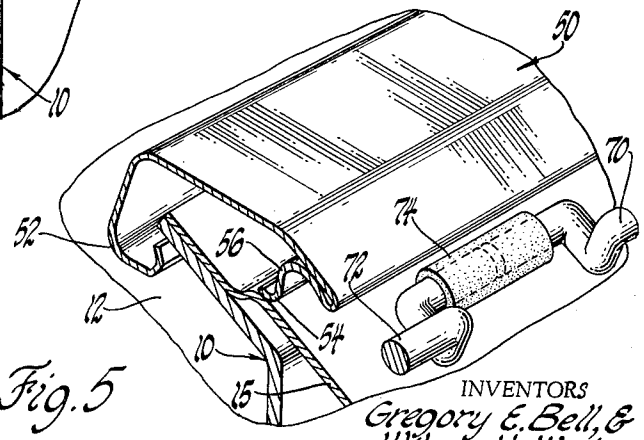


Fig. 5

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CONVERTIBLE DUST BOOT SECURING AND TENSING MEANS

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This invention relates generally to an automotive vehicle having a convertible top and more particularly to the construction of a dust boot and to means for securing the boot to close a top storing well opening upwardly and transversely of the vehicle body.

In the past, bottom type snaps have been used to secure the several edges of the dust button on cooperating studs or buttons mounted on the vehicle body adjacent the periphery of the top well opening. Minor variations in the assembled spacing of such snaps and buttons, however, have made it difficult to secure and tension the boot properly between the top well opening body members. Such manufacturing variations have necessitated the individual fitting of each boot on a completed vehicle. Relocation of the various snaps on the boot has often been required to permit satisfactory engagement with the body mounted buttons. Boot shrinkage and distortion may also occur during storage or partial removal. Resulting deviations and snap spacing make the boot difficult to secure without substantial effort. The exposed studs or buttons on the body also tend to collect dirt and corrosive agents. During boot removal when the top is raised, such corrosive dirt may subsequently foul and corrode the springs and sockets of the mating boot snaps.

Recently, boot securing snaps have been slidably mounted for limited movement within flexibly reinforced fabric folds forming the several edges of the boot. In boots of this type, each snap is mounted on a backing plate or flange member and depends through a slot opening downwardly through the boot edge underfold and extending parallel to the edge of the boot. These floating snaps have obviated some of the manufacturing and boot securing difficulties previously experienced with snaps fixedly secured to the boot edges. However, each floating snap must be individually located and maintained during assembly and stitching of the reinforced boot edging folds. Such snaps also tend to shift during boot storage and thus often require individual readjustment during boot attachment.

The invention contemplates an improved boot construction facilitating boot manufacturing and having simple inexpensive easily assembled means flexibly reinforcing the peripheral edges of the boot with spaced depending portions insertable into cooperative retaining means on the vehicle body to removably attach and tension the boot relative to the well opening. The cooperative boot securing means thus provided eliminates the critical spacing requirements of conventional snap secured boots and permits the inexpensive manufacture of interchangeable boots without fitting and relocation of the boot securing means.

With regard to certain more specific aspects, the invention further contemplates and features the use of a plurality of boot edge reinforcing rods or members having depending end portions suitably interconnected for flexible articulation to permit folding of the boot. These depending end portions preferably form crank arms insertable into a retaining groove or channel formed longitudinally of a finish molding suitably secured to the belt line pinchweld of the vehicle body. The belt molding inserted ends of the several boot edge reinforcing rods thus cooperate to secure the rear and side edges of the boot tensively against suitable means securing the forward portions of the boot to the body member or members defining the forward opening of the top receiving well.

The foregoing and other objects, advantages and features of the invention will be apparent from the following description of the several illustrative embodiments having reference to the accompanying drawings in which:

FIGURE 1 is a fragmentary perspective view of the top well portion of a convertible vehicle body with the top down and shows the installation of a dust boot closing the top well opening of the body in accordance with the invention;

FIGURE 2 is an enlarged fragmentary sectional view taken through the belt molding secured boot substantially in the plane indicated at 2—2 of FIGURE 1;

FIGURE 3 is an exploded fragmentary perspective view with portions of the boot broken away to show the articulated interconnection of the adjacent crank ends of two boot edge reinforcing rods prior to boot retaining insertion in the belt molding channel;

FIGURE 4 is a view similar to FIGURE 2 and shows a modified form of the invention; and

FIGURE 5 is an exploded perspective view somewhat similar to FIGURE 3 and further illustrating the embodiment of FIGURE 4.

Referring more particularly to FIGURE 1, an intermediate rear portion of a convertible automotive vehicle body is indicated generally by the reference numeral **10**. A top receiving well **12** opens upwardly and transversely of the body between a rear seat back **14** and a belt line forming body panel **15**. Two linkage receiving cans **16** laterally flank the rear seat and form forward extensions of the well proper. The well **12** is adapted to receive and store a conventional linkage foldable convertible top partially shown in phantom broken lines at **13** in FIGURE 2. A dust boot **18** is provided to enclose the top well when the top is retracted to its folded down position. Made of a suitable wind and weather impervious fabric or plasticized sheet material, this boot slightly exceeds and thus overlies the peripheral dimensions of the top well opening.

The laterally opposite side portions of the illustrative dust boot **18** are secured forwardly at **17** by suitable button engageable snaps to the adjacent well extending cans **16**. The intermediate forward edge of the boot may be secured at **19** to the transverse upper edge of the rear seat back **14** by suitable boot tensing means much as disclosed in copending United States patent application Serial No. 224,873, filed September 19, 1962, in the names of James H. Wernig and Virgil R. Hallenbeck and entitled "Convertible Top Boot Retaining Means," and since abandoned, and United States patent application Serial No. 333,101, filed December 24, 1963, in the names of Kenneth E. Coppock and Virgin R. Hallenbeck, entitled "Convertible Dust Boot Construction and Securing Means," both of which applications are assigned to the assignee of the present invention.

As best shown in FIGURES 2 and 3, the transverse rear and outer side edges of the top well opening are defined by a finish molding **20** secured by a plurality of spaced clips **21** to a body belt line pinchweld **22** including the flanged edge of the body panel **15**. This belt molding forms a continuous boot retaining spring socket or channel **23** opening upwardly and outwardly of the body and longitudinally of the molding between a forwardly and inwardly extending flange **24** and a rearwardly extending pinchweld mounted portion **25**. The raised top sealingly engages both the beaded forward edge of the belt molding flange **24** and the base curvature of the boot retaining channel **23**.

With further reference to FIGURES 2 and 3, the rear and outer side edges of the boot are folded over and rein-

forced by a binding strip 32 suitably secured thereto by stitching 34 thus forming a peripheral boot edging loop 36. A plurality of flexible spring rods 38–45 are mounted within this loop and serve to reinforce the peripheral edges of the boot 18. These rods may be formed from suitable spring wire stock or pressure molded of stiff resilient plastic material. Each rod has bent end portions depending through slots provided in the boot edging loop. These depending rod end portions are insertable into and cooperate with the spring channel socket 23 of the belt molding to secure and tense the body attached boot.

In the illustrative embodiment, the adjacent ends of the several rods are oppositely bent to form axially alignable crank arms. These crank arms and portions are interconnected by flexible sleeves 48 which provide boot folding articulation between the several rod segments. The sleeves 48 are preferably formed of nylon or similar plastic material capable of providing the requisite articulated flexibility and having durable rattle-free bearing characteristics permitting boot retaining insertion of the depending rod ends within the molding formed channel socket without scuffing of the bright metal finished upper surfaces of the belt molding. To permit successive boot securing and tensing insertion of the several depending rod ends longitudinally of the belt molding, each flexible sleeve is preferably secured to one rod end and journaled with respect to the adjacent rod end.

In the alternative embodiment shown in FIGURES 4 and 5, the pinchweld mounted belt molding 50 is formed to provide a smooth upper surface extending between two depending and reversely bent flanges 52 and 54 spaced inwardly and rearwardly of the top well opening. As shown in FIGURE 4, the forward or inner flange 52 is sealingly engageable with the raised top. The depending flange 54 of the belt molding forms a boot retaining spring channel 56 extending inwardly of the molding and opening rearwardly and outwardly of the vehicle and extending continuously along the rear and lateral edges of the top well.

In this form of the invention, the rear and side edges of the boot are laminated with strips of reinforcing material 60 and 62. A folding binding strip 64 is secured to and finishes the outer peripheral edges of the boot. A folded strip of pliable sheet material 66 is secured at 67 to the laminated undersurface of the outer boot portions and forms a loop 68 spaced a marginal distance inwardly of the boot edge finishing strip 64. As in the previous embodiment, the loop 68 pivotally mounts a plurality of spring rods 70 and 72 having depending end portions bent for boot retaining insertion into the belt molding formed channel 56. As before, the adjacent depending ends of the several boot mounted rods 70 and 72 are oppositely bent to form axially alignable crank arms which are preferably interconnected by flexible sleeves 74 to provide boot folding articulation and relative boot tensing rotation between the several adjacent rods during the boot attaching process.

While the invention has been described with reference to several illustrative embodiments, it will be apparent that various modifications and changes might be made therein without departing from the spirit and scope of the invention as defined in the following claims.

We claim:

1. In a vehicle body having a convertible top housing well opening upwardly and transversely of the body,
- a dust boot for closing said well having peripheral edge portions overlying the well opening edges of the body,
- means securing a first boot edge to a corresponding first well opening edge on the body,
- a first spring means forming a channeled recess spaced from a second well opening edge on the body opposite said first well opening edge and opening generally outwardly of the body,
- and a second spring means secured to and reinforcing a second boot edge portion lying adjacent said channeled recess and having depending arms at spaced intervals insertable for boot retaining and tensing engagement within said channeled recess.

2. In a convertible vehicle body having a top well opening upwardly and transversely of the body,
- a pliable dust boot for said well having peripheral edge portions overlying the well opening edges of the body,
- means securing the boot forwardly to corresponding edges of the body formed well opening,
- a belt molding secured to the body adjacent the outer rear peripheral edge of the well and forming a channeled recess opening outwardly of the well body,
- means forming a continuous loop adjacent the peripheral outer rear edge portion of the boot and having spaced perforations therein located adjacent said channeled recess,
- and a plurality of resilient members mounted in said loop and having bent arm portions depending through the perforations in said loop and swingable relative thereto for insertion within the channeled recess of the belt molding thereby securing and tensing the installed boot rearwardly against the forward boot securing means.

3. In a vehicle body having a convertible top receiving well opening upwardly and transversely of the body,
- a pliable dust boot for closing said well having peripheral edge portions overlying the well opening edges of the body,
- cooperating means for securing the transverse forward edge of the boot to the corresponding transverse forward well opening edge of the body,
- a belt molding secured to the body adjacent the outer rear peripheral edge of the well opening and forming a channeled recess opening outwardly of the body and well,
- the peripheral outer rear portion of the boot lying adjacent said channeled recess having a continuous boot edging loop formed thereon and including downwardly facing perforations therein at spaced intervals,
- a plurality of boot edge reinforcing members mounted in said boot edging loop and each having oppositely bent crank arm end portions depending through adjacent perforations in the boot edging loop,
- means for interconnecting the adjacent crank arm end portions of the several boot edge reinforcing members to permit articulated folding of the boot and boot edge reinforcing members,
- and said interconnected crank arm end portions being insertable within the channeled recess of the belt molding to secure and tense the installed boot rearwardly against the forward boot securing means.

4. In combination with a convertible vehicle body having a top storing well opening upwardly and transversely of the body,
- a pliable dust boot for closing said well opening having peripheral edge portions overlying the well opening edges of the body,
- means for securing the forward edge of the boot to the well opening forward edges of the body,
- a belt molding secured to the body adjacent the outer rear peripheral edge of the well opening and forming a continuous resilient channel opening rearwardly and outwardly of the body and well opening,
- fabric means secured to the peripheral outer rear edge of the boot and folded to form a continuous loop overlying said molding channel and having spaced perforations therein facing said molding,
- a plurality of resilient rods freely mounted within said continuous loop and each having oppositely bent crank arm end portions depending through adjacent perforations in said loop and swingable forwardly and inwardly of the boot edge,

and said swingable crank arm end portions of said resilient rods being insertable within the resilient channel of the belt molding to secure and smoothly tense the installed boot rearwardly against the forward boot securing means.

5. The combination set forth in claim 4 further including

means for rotatably and flexibly interconnecting the adjacent crank arm end portions of the several resilient rods to permit sequential insertion of the rod end portions within the boot retaining channel of the belt molding and articulated folding of the boot for storage.

6. In a vehicle body having a convertible top foldable between a raised position and an opened position retracted within a top storing well opening upwardly and transversely of the body,

a pliable dust boot for closing said well hand having peripheral edge portions overlying the body edges defining the well opening,

means securing the forward edges of the boot to the corresponding forward edges of the body formed well opening,

a belt molding secured to the body adjacent the outer rear peripheral edge of the well opening and forming a continuous resilient channel opening upwardly between a rearwardly extending body edge mounted flange and a forwardly and inwardly extending flange sealingly engageable with the raised top,

means on said boot forming a continuous loop adjacent the peripheral outer rear edge of the boot and having spaced perforations therein opening toward the channel of said belt molding,

and a plurality of resilent rod members rotatably mounted in said continuous loop and each having oppositely bent crank arm end portions depending through the spaced perforations in said loop and swingable relative thereto for insertion within the resilient channel of the belt molding thereby securing and evenly tensing the forwardly secured boot rearwardly of the top well body opening.

7. The combination set forth in claim 6 further including

means for flexibly interconnecting the adjacent crank arm end portions of the several resilient rod members to permit sequential insertion of the adajcent interconnected rod end portions within the resilient retaining channel of the belt molding and to permit articulated folding of the boot for detached storage.

8. A pliable dust boot adapted to overlie and enclose a retractable top housing well opening upwardly and transversely of a convertible vehicle body having a belt finish molding defining the rear and outer peripheral edges of the body well opening and forming a continuous boot retaining spring channel recess opening outwardly thereof,

means for securing the forward edge of the boot to cooperating means mountable adjacent the forward well opening edges of the body,

means forming a continuous loop on the outer rear edge portion of the boot and having spaced perforations therein normally facing the finish molding when the boot is attached to the body in its top well closing position,

a plurality of resilient rods loosely mounted in and extending through said continuous loop, and

each of said rods having bent opposite end portions depending through adjacent perforations in said loop and forming crank arms swingable relative to the adjacent boot edge and insertable within the spring channel recess of the belt molding to secure and smoothly tense the body installed boot rearwardly against the forward boot securing means.

9. A pliable dust boot as set forth in claim 8 further including

means for rotatably and resiliently interconnecting the adjacent crank arm end portions of the several resilient rods to permit simultaneous insertion of the adjacent interconnected rod end portions within the boot retaining spring channel recess of the belt molding and to permit articulated folding of the detached boot for storage.

10. A pliable dust boot adapted to overlie and enclose a foldable top retracted within a top housing well opening upwardly and transversely of a convertible vehicle body having a belt finish molding forming a continuous boot retaining spring channel recess opening rearwardly and outwardly of the body in spaced relation to the belt molding defined rear and outer peripheral edges of the body well opening,

means engageable to secure the forward edge of the boot to cooperating boot securing means mountable adjacent the forward well opening edges of the body,

means forming a continuous loop adjacent the peripheral outer rear edges of the boot and normally overlying said molding spring channel recess and said loop having spaced perforations therein facing said molding,

a plurality of resilient rods mounted in and extending through said loop,

each of said rods having opposite end portions bent to form crank arms depending through adjacent perforations in said loop and swingable forwardly and inwardly of the boot edge,

and resilient means for rotatably and flexibly interconnecting the adjacent crank arm end portions of the several resilient rods to permit simultaneous insertion of the interocnnected rod end portions within the boot retaining spring channel recess of the belt molding to secure and smoothly tense the installed boot rearwardly against the forward boot securing means and to permit articulated folding of the detached boot for storage.

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