Title: VEHICLE SEATING ARRANGEMENT WITH CUP HOLDERS

Abstract: A seat structure including an armrest incorporating one or more accessories, such as cup holders, said one or more accessories having a substantially rigid upper rim portion and a substantially flexible lower portion.
VEHICLE SEATING ARRANGEMENT WITH CUP HOLDERS

Field of the Invention

This invention relates to improvements in vehicle seating and relates particularly to improvements in an armrest structure, or similar, which incorporates a secondary functional accessory.

The invention relates particularly to automotive vehicle seating but may have application in other seating, including seating used in aircraft, domestic situations, restaurants, theatres and the like. For ease of description and understanding, however, the invention will be described herein in relation to its application to vehicle seating.

Background of the Invention

To maximise the occupant space and roominess within a vehicle, all parts and accessories within the vehicle compartment are becoming more compact. The development of new materials assists vehicle manufacturers and parts suppliers to minimise the space occupied within the vehicle compartment by the various components, including seating. However, while vehicle manufacturers demand superior appearance, comfort and features to maintain and grow their market share, restricting the space occupied by components, parts and accessories often results in a compromise between appearance, comfort and level of satisfaction in relation to the features offered.

One example is vehicle seating. Due to the desire to reduce the space occupied by the seating, seat cushioning is becoming thinner although improvements in materials used has, so far, minimised loss of comfort. However, with a reduction in thickness of seat cushioning material, a greater risk exists that an occupant may feel hardware located within the seat structure thereby resulting in customer discomfort and possible annoyance. Such a relatively minor detail may result in the customer having an adverse perception of the vehicle seat which could reflect badly on the overall appeal of the vehicle.

In one particular seat structure, a pull down armrest is fitted with a cup holder for the convenience of passengers. The cup holder is formed of a relatively rigid, synthetic plastics material, such as polypropylene, and is secured within the armrest such that, when the armrest is in the lowered position, the cup holder is available for use by the vehicle passengers to hold one or more drink containers, or the like.

When the armrest is in a raised position, it acts as a backrest for a passenger seated on the seat portion in front of the armrest position. However, because the cup holder structure within the armrest occupies a substantial part of the thickness of the armrest, a seated passenger may be discomforted by the relatively rigid cup
holder structure in the supporting seat backrest formed by the raised armrest. Thus, the seat occupant, when leaning back against the seat backrest formed by the raised armrest, may compress the relatively thin seating material below the bottom of the cup holder and feel the rigid form of the cup holder.

It is therefore desirable to provide improvements in vehicle seating which incorporates a secondary functional accessory, such as an arm rest.

It is also desirable to provide an improved seat structure whereby the mounting of cup holders within a moveable armrest will be substantially undetected when the armrest is used as a seat back portion.

It is also desirable to provide a seat structure which is relatively simple and economical to manufacture and install.

It is also desirable to provide an improved seat structure having a cup holder in the seat armrest whereby the cup holder is fully functional in the same manner as the existing, relatively rigid cup holders currently provided.

It is also desirable to provide an improved seat structure having an armrest with cup holders, the armrest being able to be raised and lowered whereby the cup holders are available for use in the lowered position but in the raised position the existence of the cup holders is substantially undetectable.

It is also desirable to provide improved cup holders for use with vehicle or other seating.

Summary of the Invention

In accordance with one aspect of the invention there is provided a seat structure including an armrest incorporating one or more accessories, such as cup holders, said one or more accessories having a substantially rigid upper rim portion and a substantially flexible lower portion.

In particular embodiments of the invention, the one or more accessories includes a pair of cup holders mounted in the armrest. In particularly preferred embodiments, a pair of cup holders are formed as an integral unit with the upper rim portion thereof moulded of a substantially rigid, synthetic plastics material whereby the rim portion retains its shape and is able to resist loads applied thereto without distortion.

In one particular embodiment, the upper rim portion is moulded of a substantially rigid synthetic plastics material, such as polypropylene, polyethylene or polycarbonate.

Preferably, the lower portion of the accessory is formed of a flexible, thermoplastic elastomer, such as "Thermolast K" (trade mark) or natural or synthetic rubber, or the like. The flexible material may have a hardness of between 50 and 120
(Shore A). The flexible lower portion is formed integral with the rigid upper rim portion or is adhered thereto or moulded thereon. The flexible lower portion is of a shape to provide proper support for drink cups or containers to be used with the cup holder.

According to another aspect of the invention there is provided a cup holder for use in a seat structure, said cup holder having a substantially rigid upper rim portion and a lower portion able to move relative to the upper rim portion towards and away therefrom to thereby reduce the effective depth of the cup holder.

Preferably, the lower portion of the cup holder is formed of a thermoplastic elastomer, rubber or other flexible material which is formed integral with, adhered to, or moulded onto the rigid upper rim portion.

Alternatively, however, the lower portion may be of a telescopic structure, or formed of a waterproof, flexible fabric material, or has a substantially rigid base with flexible side walls connecting the lower portion to the upper rim portion. Such structures will enable the lower portion of the cup holder to move relative to the rigid upper rim portion thereby facilitating deflection of the material of the armrest into which the cup holder is mounted when the armrest is in the raised position and is used as a seat backrest. Thus, by enabling the lower portion of the cup holder to be flexible or to be able to move relative to the rigid upper rim portion, the provision of a cup holder within an armrest used as a seat back will be substantially unnoticeable.

Preferably, the collapsible lower portion of the cup holder will offer some resistance to deflection when a seat occupant engages with the armrest in the backrest position. Such deflection, however, is temporary and, when the load is removed from the backrest, the collapsible lower section returns to its original cup holder shape.

The cup holder of preferred embodiments of the invention will be attached to the frame or structure of the armrest in a conventional manner such as through the use of clips, fasteners or the like. In one form, the bottom of the flexible lower portion is attached to the internal material of the armrest such as by adhesive, clips or other attachment means so that resilient movement of the bottom of the armrest, used as the backrest, is transferred to the bottom portion of the flexible lower portion.

**Brief Description of the Drawings**

In order that the invention will be more readily understood, one embodiment thereof will now be described with reference to the accompanying drawings wherein:

Figure 1 is a schematic side sectional view of a seat back incorporating an armrest containing cup holders of the prior art;
Figure 2 is a top perspective view of cup holders in accordance with an embodiment of the present invention;

Figure 3 is a side elevational view of the embodiment of Figure 2; and

Figure 4 is a top perspective view of a seat armrest incorporating cup holders of the embodiment of Figure 2.

**Detailed Description of the Preferred Embodiment**

Referring to the drawings, a cup holder mounted in a seat armrest is required to hold cups or containers (not shown) of a variety of sizes and height during normal vehicle operating conditions. The stability of the containers is important, so the depth of the cup holder is generally maximised to minimise the likelihood of spillage. When combined with the reduction in thickness of an armrest pad 14, a seat occupant 16 using the vehicle seat with the armrest 14 in a raised position, as shown in Figure 15, is likely to feel the relatively hard surfaces of the bottom of the cup holder mounted in the armrest pad 14. Thus, the occupant 16 will compress the armrest pad 14 to an extent that the bottom edges of the cup holder 12 are able to be felt, possibly causing discomfort.

Referring to Figure 2, a cup holder in accordance with the illustrated embodiment is formed with a substantially rigid upper rim portion 18. In the embodiment illustrated, the cup holder is designed to support two cups or containers in a side by side relationship. The substantially rigid upper rim portion 18 is formed of a polypropylene, or other substantially rigid, thermoplastic material which is able to be easily moulded, and which is durable, resists marring or scratching or other damage under normal use conditions. Furthermore, by being substantially rigid, attachment to a frame structure of the armrest 14 is able to be achieved by known means such as through the use of integral or additional clips, fasteners or the like.

The upper rim portion 18 includes downwardly extending upper cup support walls 19 which form a part circular wall defining the upper part of the receptacle into which a cup or container is inserted in use. In the illustrated form, the wall 19 defining the upper cup supports defines a tapering shape to snugly receive a range of container sizes.

The cup holder 12 of the embodiment further comprises a flexible lower portion 21 which extends downwardly from, and is integral with, or adhered to the upper cup support wall 19. The lower portion 21 has side walls 22 tapering at substantially the same angle as the walls 19 and having a bottom wall 23.

The lower portion 21 is formed of a flexible, thermoplastic elastomer, rubber, waterproof fabric or other flexible, preferably waterproof material. Thus, the flexible
lower portion 21 is able to be deformed or deflect under load. Preferably, the material is resilient such that when a deforming load is removed, the lower portion 21 will return to its normal shape.

By using a flexible, deformable, compressible or otherwise deflectable lower portion 21, comfort concerns can be minimised. The design and materials which allow the bottom portion of the cup holder 12 to be flexible means that, when used in an armrest 14, as shown in Figure 4, when the armrest is moved to the raised position to be used as a seat back, pressure on the armrest pad 14 by an occupant 16 will cause the lower portion 21 to deflect away from the load so that the cup holder 12 is not detected.

In modifications of the invention (not illustrated), the flexible lower portion 21 may comprise telescopic sections which are sealed together, possibly using membranes, and provide a waterproof receptacle for a drink container or the like.

It will be appreciated that other vehicle accessories may also be constructed using the feature of a rigid face part and a relatively flexible secondary part. All such modifications are within the scope of the present invention.

It will be appreciated by persons skilled in the art that numerous variations and/or modifications may be made to the invention as shown in the specific embodiments without departing from the spirit or scope of the invention as broadly described. The present embodiments are, therefore, to be considered in all respects as illustrative and not restrictive.
CLAIMS:
1. A seat structure including an armrest incorporating one or more accessories, such as cup holders, said one or more accessories having a substantially rigid upper rim portion and a substantially flexible lower portion.
2. A seat structure according to claim 1 such that when the armrest is moved to a raised position to be used as a seat back, pressure on the armrest by an occupant causes the lower portion to deflect away from the occupant so that the one or more accessories are not detected by the occupant.
3. A seat structure according to claim 1 or claim 2 wherein the one or more accessories includes a pair of cup holders mounted in the armrest.
4. A seat structure according to claim 3 wherein the flexible lower portion is formed as an integral unit with, adhered to or moulded to the upper rim portion.
5. A seat structure according to claim 4 wherein the upper rim portion includes downwardly extending upper cup support walls that form a part circular wall defining an upper part of a receptacle into which a cup or container is inserted in use.
6. A seat structure according to claim 5 wherein the part circular wall defines a tapering shape adapted to snugly receive a range of container sizes.
7. A seat structure according to claim 5 or claim 6 wherein the flexible lower portion extends downwardly from and is integral with, or adhered to the upper cup support walls.
8. A seat structure according to claim 7 wherein the flexible lower portion has side walls tapering at substantially the same angle as the upper cup support walls.
9. A seat structure according to claim 8 wherein the lower portion has a bottom wall integrally formed with the side walls of the lower portion.
10. A seat structure according to claim 9 wherein the bottom wall is substantially rigid and the side walls are substantially flexible to enable deformation under pressure towards the upper rim portion.
11. A seat structure according to claim 10 wherein the lower portion is able to move relative to the rigid upper rim portion thereby facilitating deflection of material of the armrest into which the pair of cup holders is mounted when the armrest is in the raised position and used as a seat back rest.
12. A seat structure according to claim 11 wherein the lower portion is of a telescopic structure or formed of a waterproof, flexible fabric.
13. A seat structure according to claim 12 wherein the lower portion of the pair of cup holders is able to move relative to the rigid upper rim portion thereby facilitating...
deflection of material of the armrest into which the pair of cup holders is mounted when the armrest is in the raised position and used as a seat back rest.
14. A seat structure according to any one of the previous claims wherein the upper rim portion is formed of a polypropylene or other substantially rigid thermoplastic material and whereby the upper rim portion retains its shape and is able to resist loads applied thereto without distortion.
15. A seat structure according to any one of the previous claims wherein the flexible lower portion is formed of a flexible, thermoplastic elastomer, rubber, waterproof fabric or material.
16. A seat structure according to claim 15 wherein the material is resilient so that when a deforming load is removed, the flexible lower portion returns to its original shape.
17. A cup holder for use in a seat structure, said cup holder having a substantially rigid upper rim portion and a lower portion able to move relative to the upper rim portion towards and away therefrom to thereby reduce the effective depth of the cup holder.
18. A cup holder according to claim 17 wherein the lower portion is formed integrally with, adhered to or moulded to the rigid upper rim portion.
19. A cup holder according to claim 18 wherein the upper rim portion includes downwardly extending upper cup support walls that form a part circular wall defining an upper part of a receptacle into which a cup or container is inserted in use.
20. A cup holder according to claim 19 wherein the part circular wall defines a tapering shape adapted to snugly receive a range of container sizes.
21. A cup holder according to claim 19 or claim 20 wherein the flexible lower portion extends downwardly from and is integral with, or adhered to the upper cup support walls.
22. A cup holder according to claim 21 wherein the flexible lower portion has side walls tapering at substantially the same angle as the upper cup support walls.
23. A cup holder according to claim 22 wherein the flexible lower portion has side walls tapering at substantially the same angle as the upper cup support walls.
24. A cup holder according to claim 23 wherein the lower portion has a bottom wall integrally formed with the side walls of the lower portion.
25. A cup holder according to claim 24 wherein the lower portion has a substantially rigid base and flexible side walls connecting the lower portion to the upper rim portion to enable deformation under pressure towards the upper rim portion.
26. A cup holder according to claim 25 wherein the lower portion of the cup holder is able to move relative to the rigid upper rim portion thereby facilitating deflection of material of an armrest into which the cup holder is mounted when the armrest is in the raised position and used as a seat back rest.

27. A cup holder according to claim 26 wherein the lower portion is of a telescopic structure or formed of a waterproof, flexible fabric.

28. A cup holder according to claim 27 wherein the upper rim portion is formed of a polypropylene or other substantially rigid thermoplastic material and whereby the upper rim portion retains its shape and is able to resist loads applied thereto without distortion.

29. A cup holder according to claim 28 wherein the flexible lower portion is formed of a flexible, thermoplastic elastomer, rubber, waterproof fabric or material.

30. A cup holder according to claim 29 wherein the material is resilient so that when a deforming load is removed, the flexible lower portion returns to its original shape.
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl.

B60N 3/10 (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC.

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Refer Electronic Database consulted below.

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched.

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Derwent World Patent Index:

B60N-003/10 and keywords: CUP+, FLEX+, TELESCOPIC+, BELLOW4, CONCERTINA+

c. DOCUMENTS CONSIDERED TO BE RELEVANT

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Further documents are listed in the continuation of Box C

[ ] See patent family annex

Date of the actual completion of the international search

03 April 2007

Date of mailing of the international search report

11 APR 2007

Name and mailing address of the ISA/AU

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END OF ANNEX