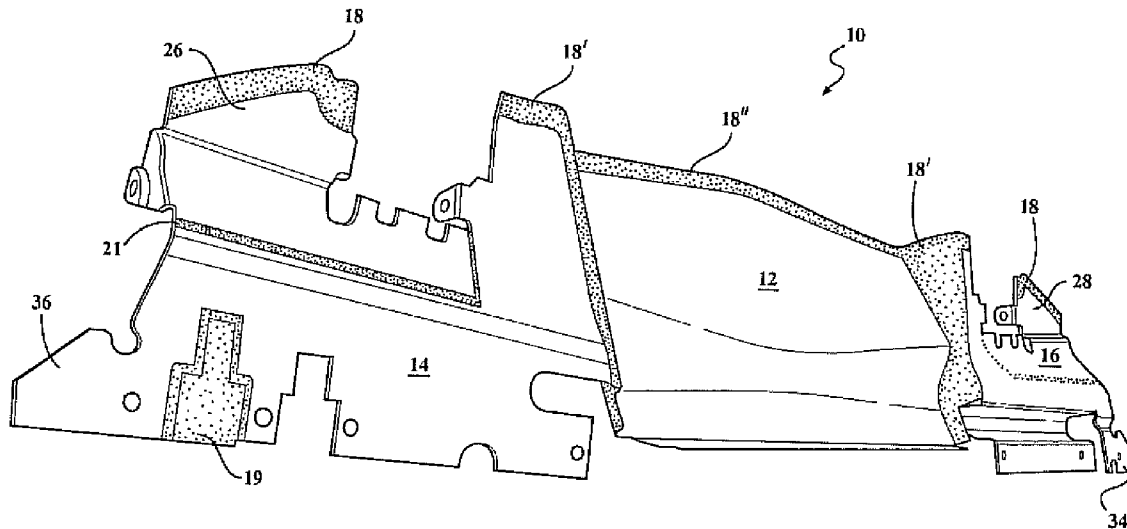




US 20130192801A1

(19) **United States**(12) **Patent Application Publication**
Leonard(10) **Pub. No.: US 2013/0192801 A1**(43) **Pub. Date: Aug. 1, 2013**(54) **RECONFIGURABLE FRONT AND UPPER
ONE PIECE BAFFLES FOR DIRECTING
INCOMING AIR FROM A VEHICLE FRONT
FASCIA TO A RADIATOR COOLING
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(US)(73) Assignee: **U.S. Farathane Corporation**, Auburn
Hills, MI (US)(21) Appl. No.: **13/794,028**(22) Filed: **Mar. 11, 2013****Related U.S. Application Data**(63) Continuation-in-part of application No. 13/726,943,
filed on Dec. 26, 2012.(60) Provisional application No. 61/585,196, filed on Jan.
10, 2012.**Publication Classification**(51) **Int. Cl.**
F28F 21/06 (2006.01)(52) **U.S. Cl.**
CPC **F28F 21/06** (2013.01)
USPC **165/109.1**(57) **ABSTRACT**

A baffle construction constructed of two or more individual sections, each exhibiting a two part/two shot injection molded material incorporating attachment details for establishing a structurally supporting framework mounting about the vehicle radiator. The baffle sections each include softer inter-connecting hinges incorporating the attachment details which assist in creating the structurally self-supporting frame. The assembled baffle defines a four sided box-like structure mounted around a vehicle radiator for directing incoming air through a fascia opening and into a cooling module associated with the radiator.



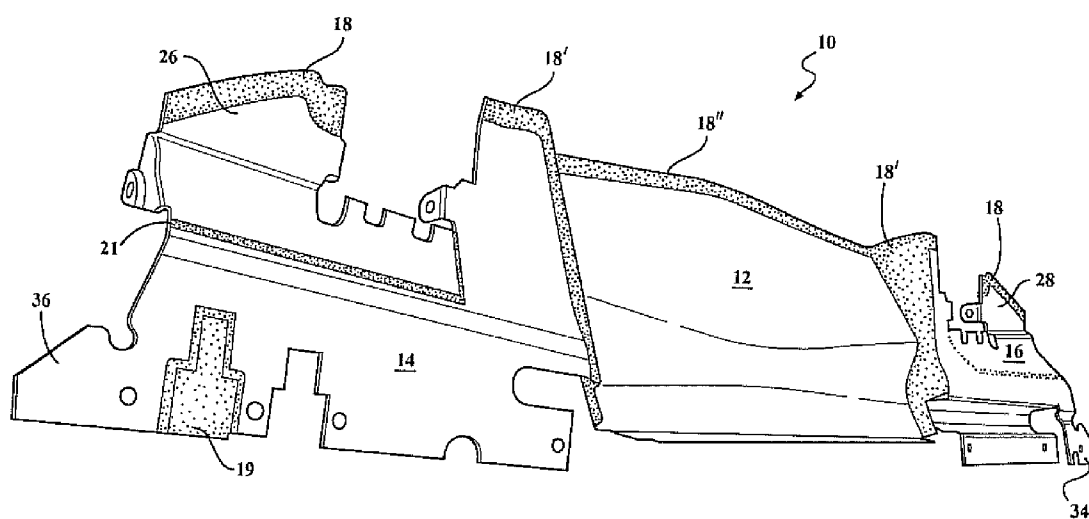


FIG. 1

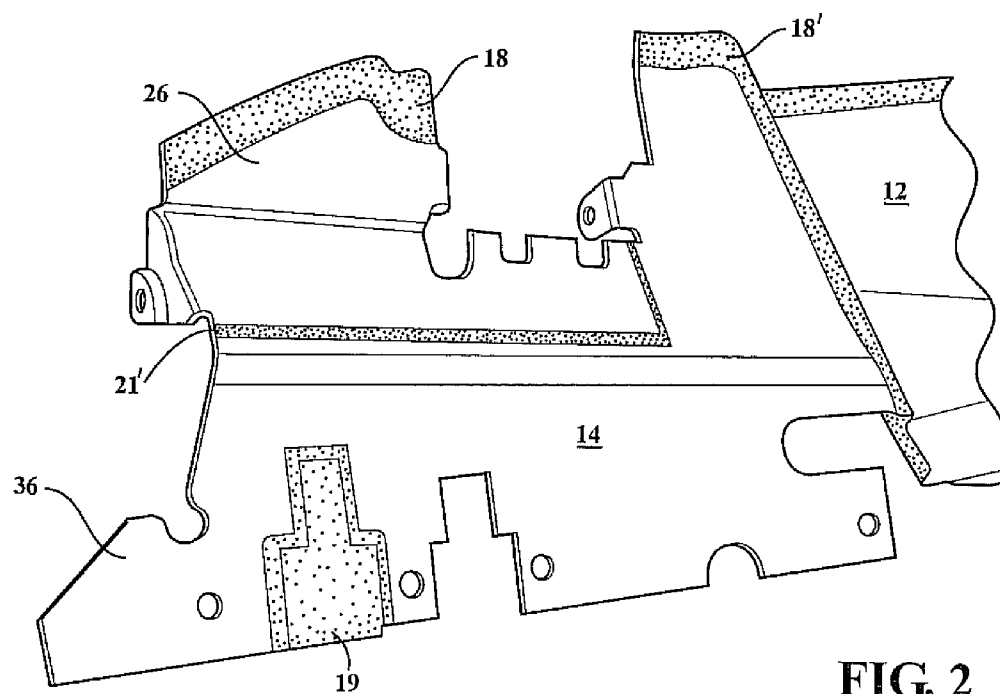


FIG. 2

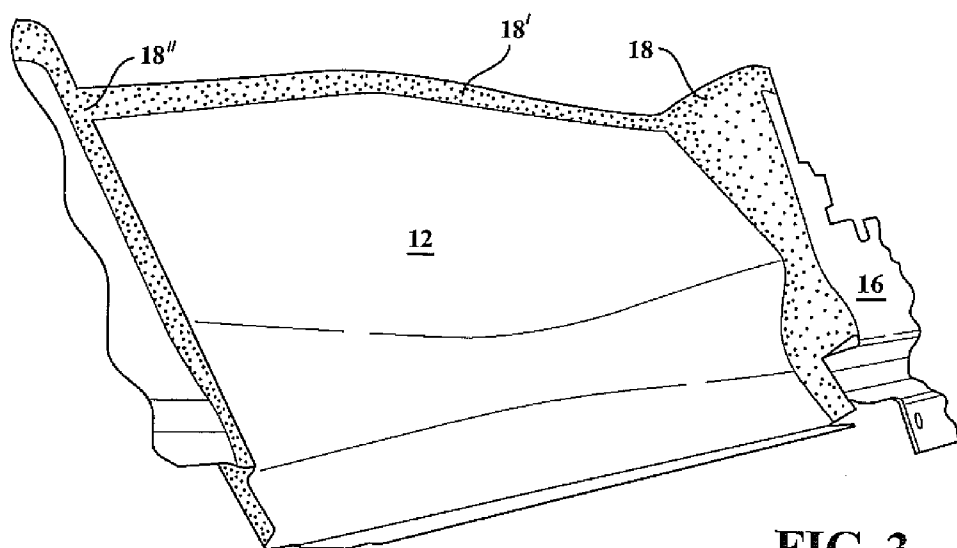


FIG. 3

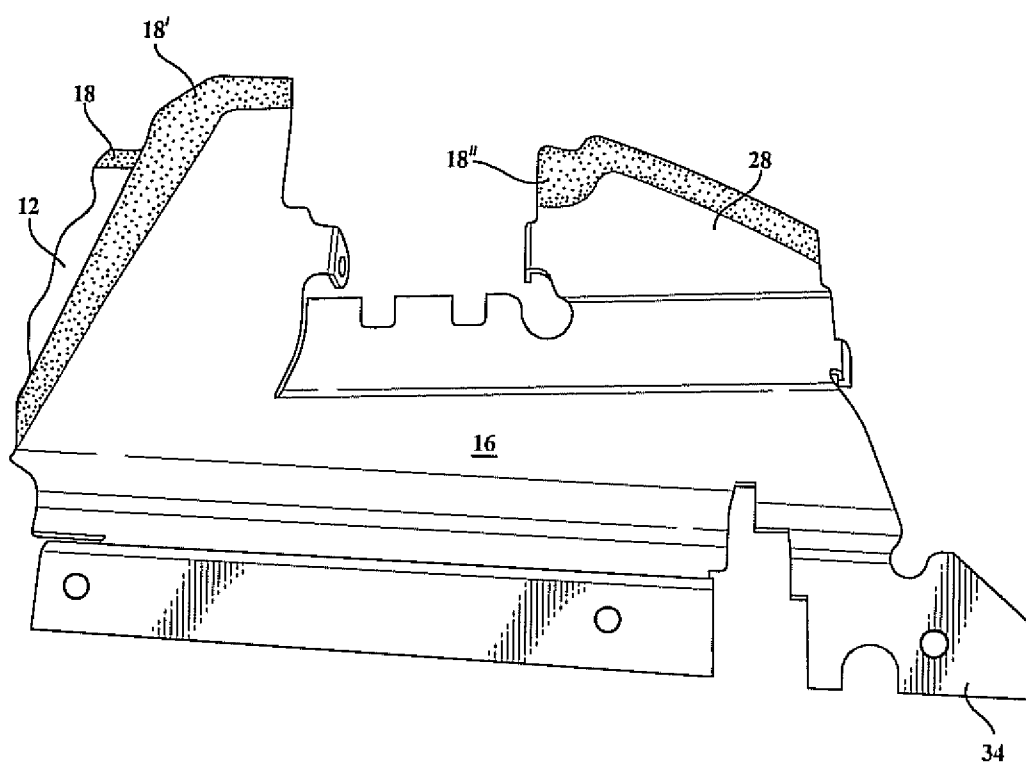
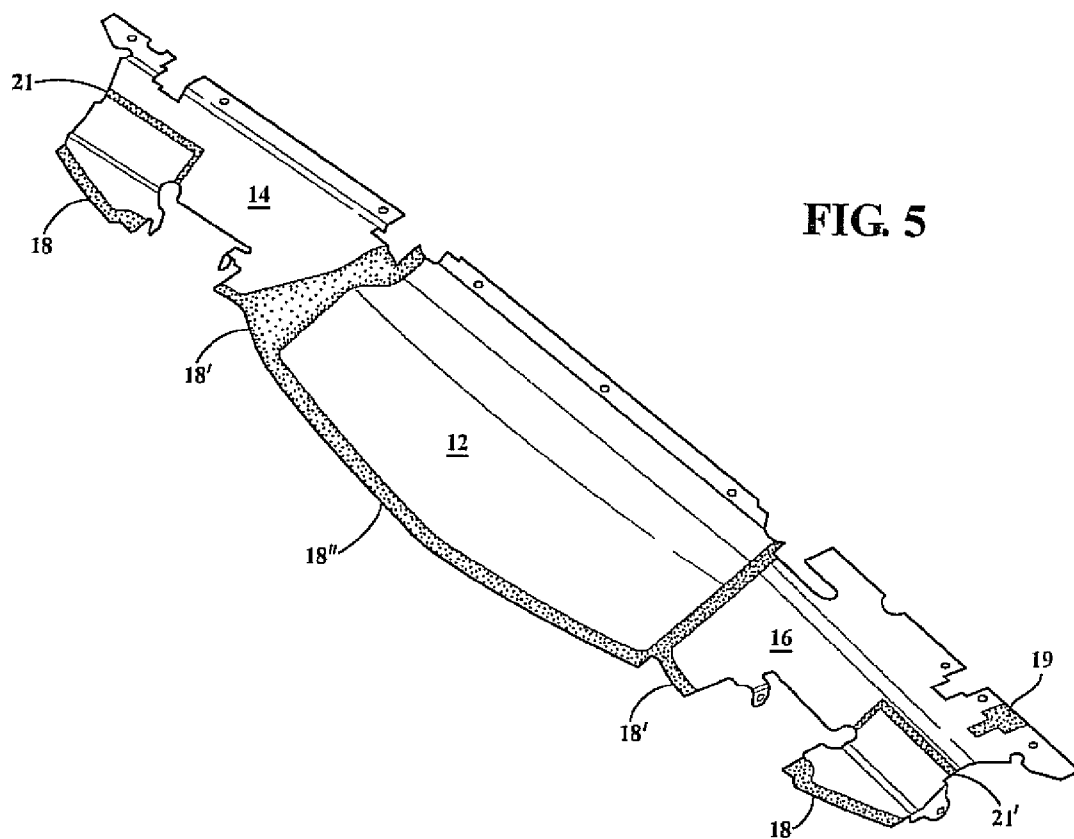


FIG. 4



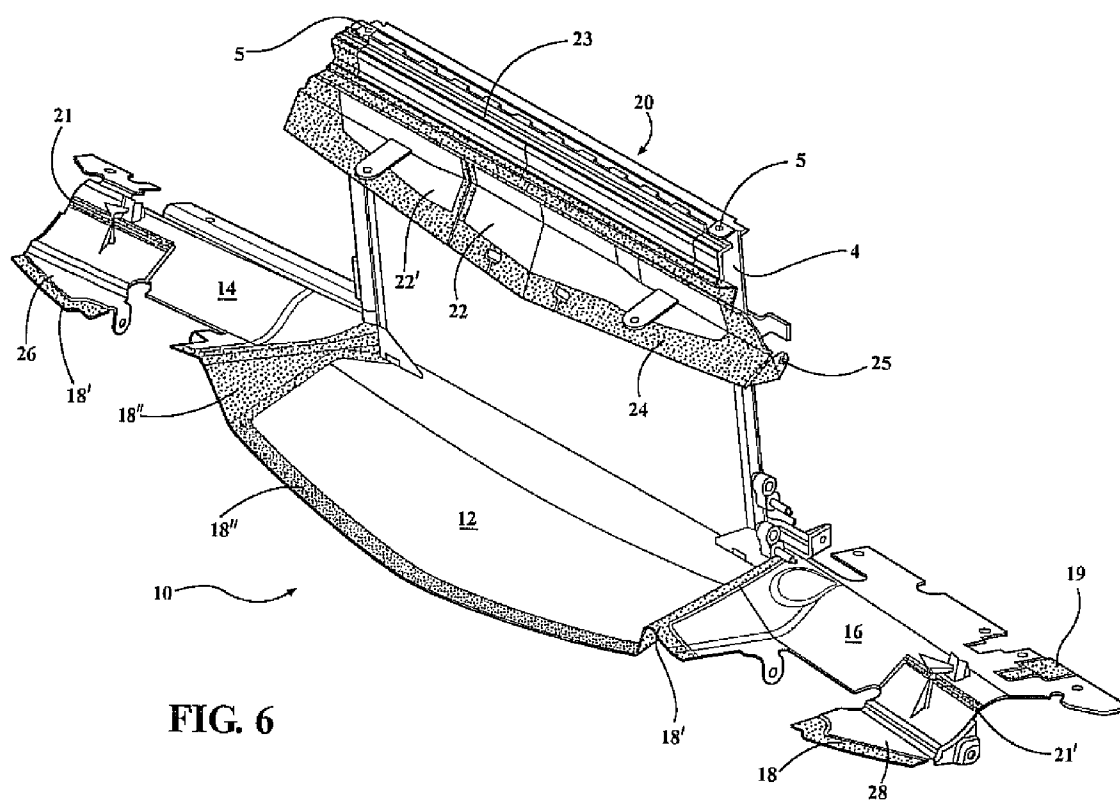


FIG. 6

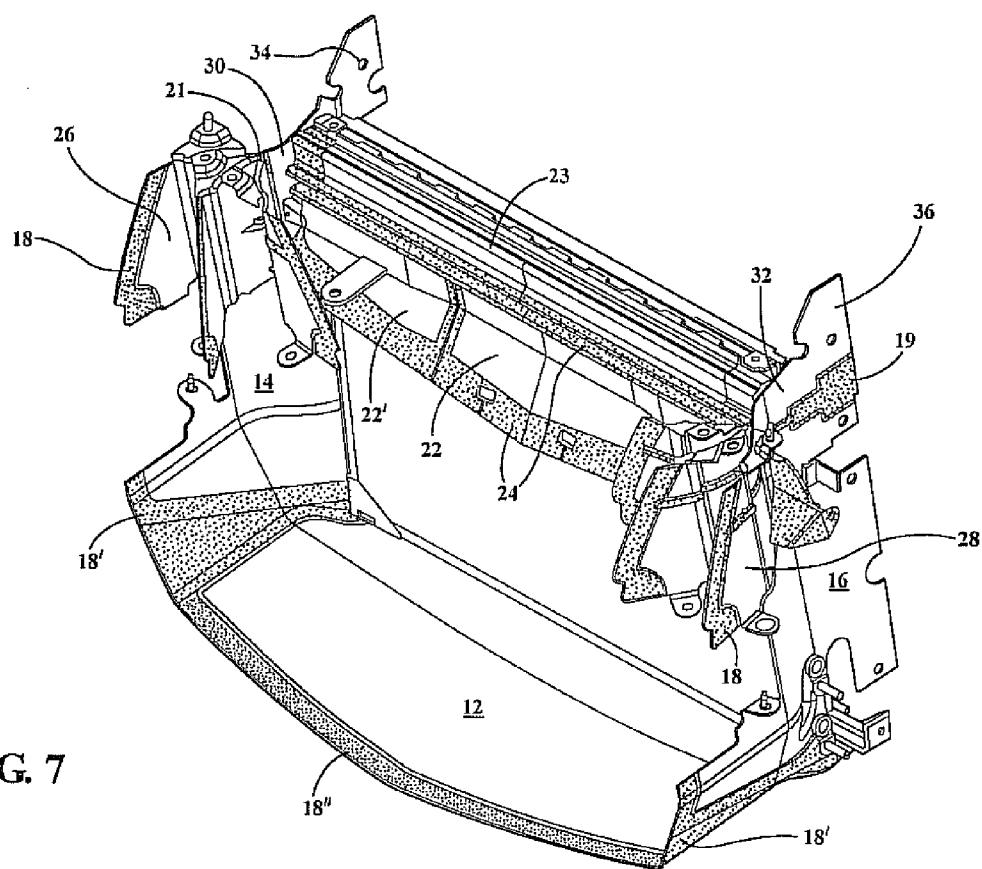


FIG. 7

FIG. 8

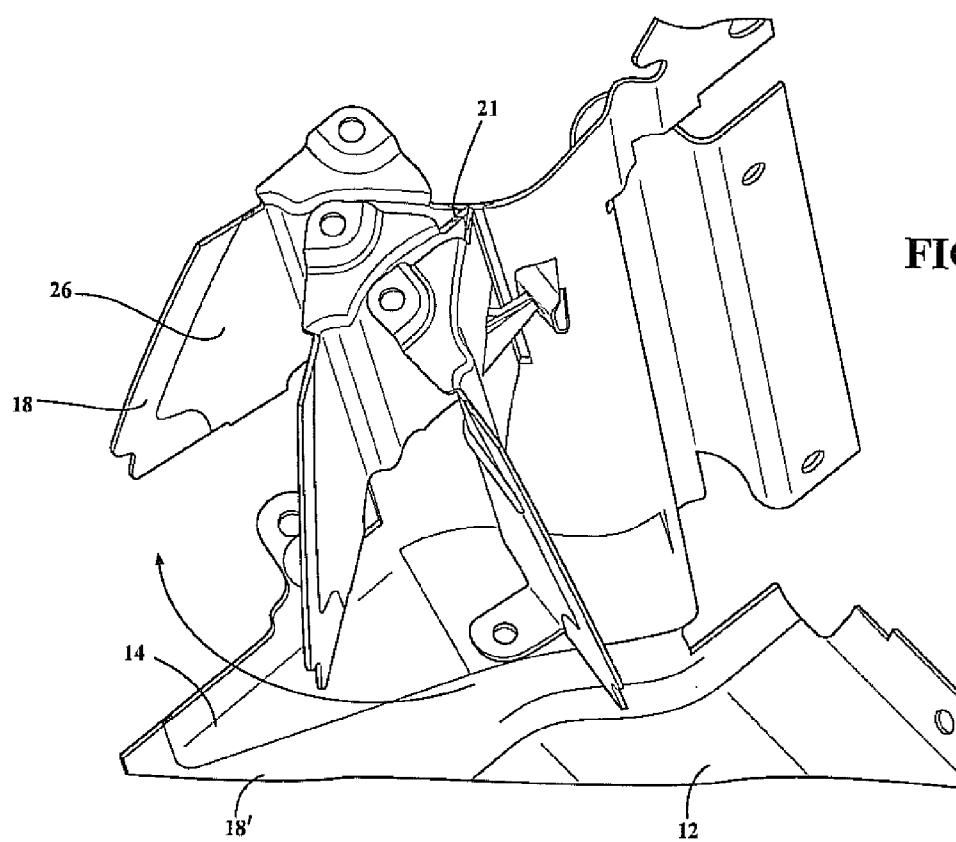


FIG. 8A

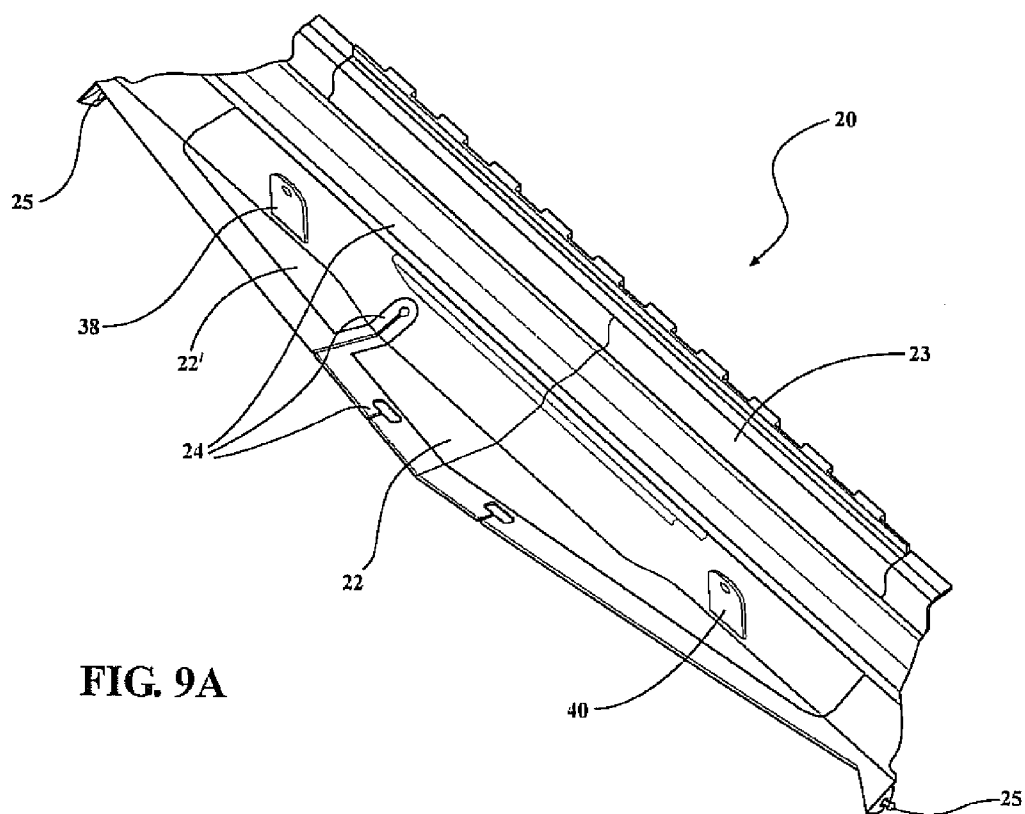
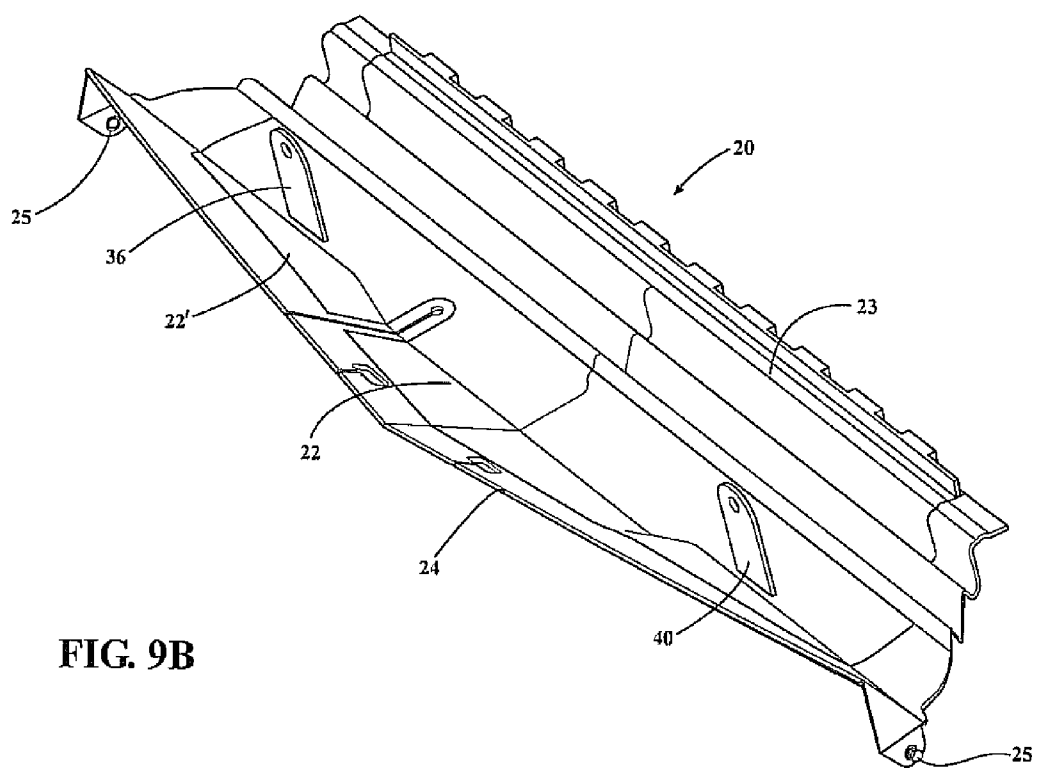


FIG. 9A



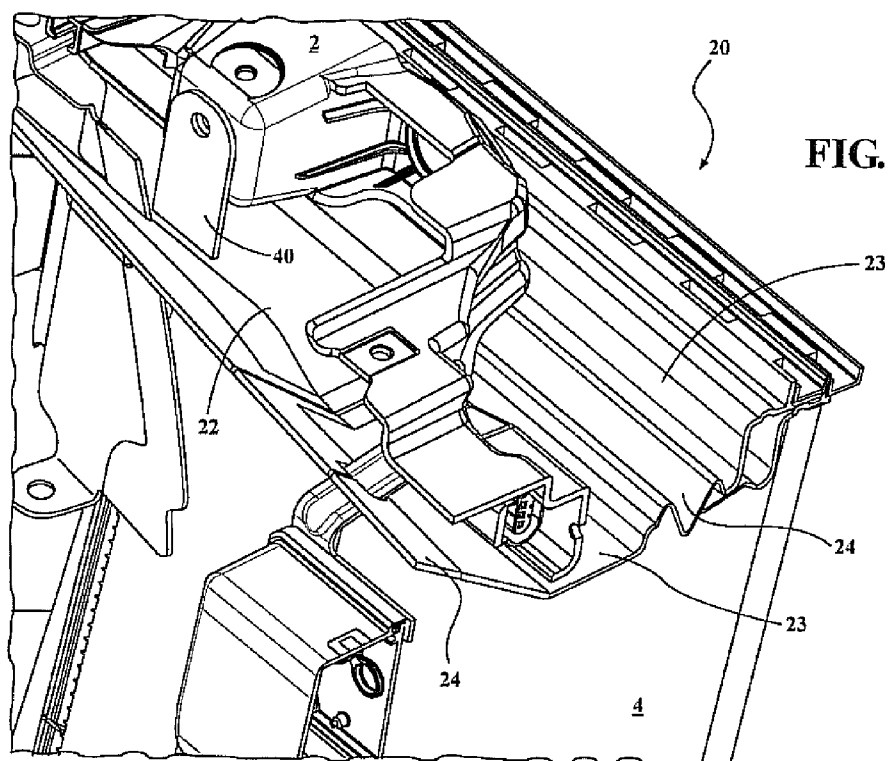


FIG. 10B

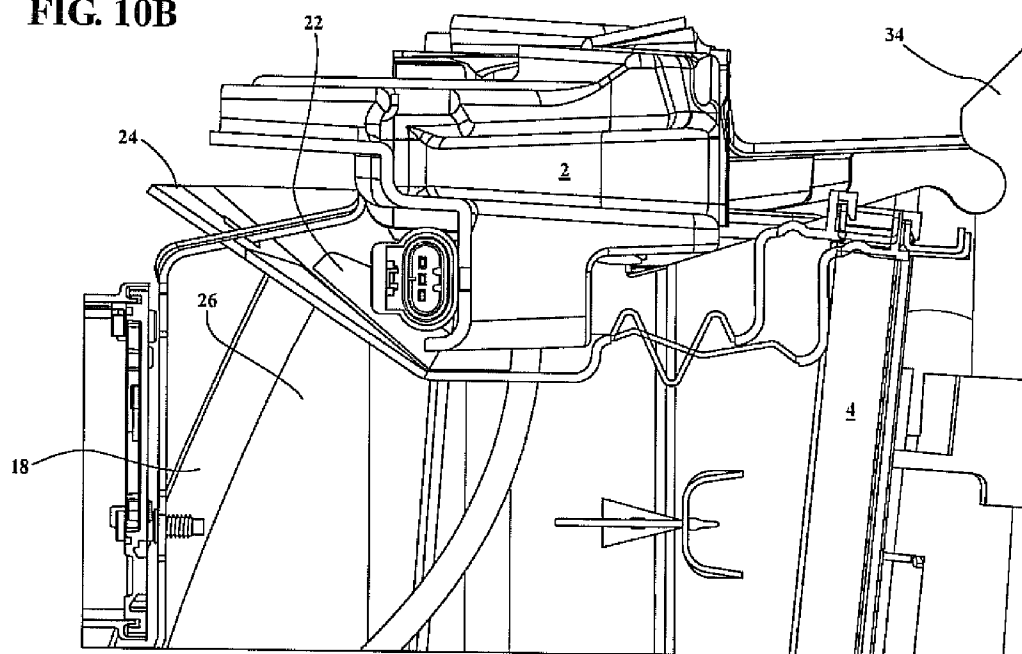
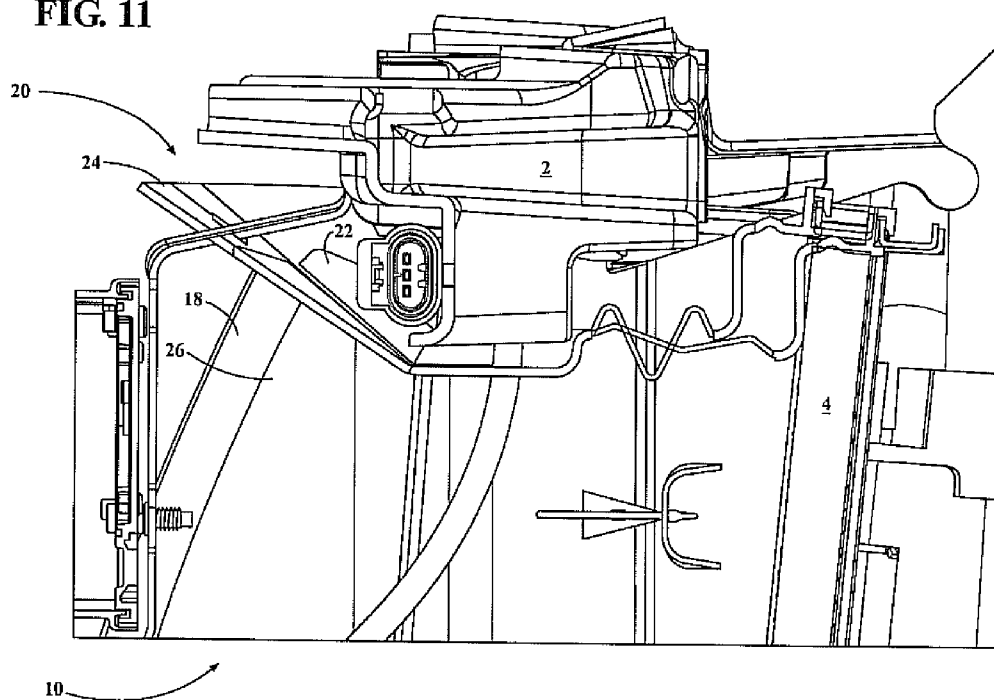


FIG. 11



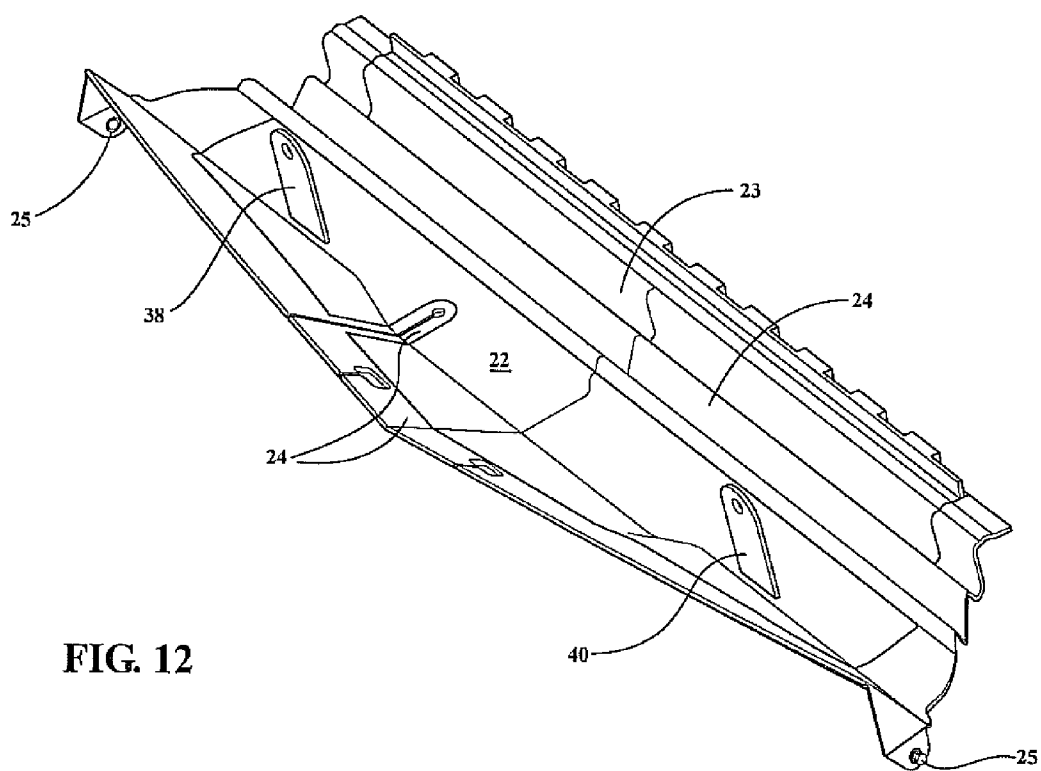


FIG. 12

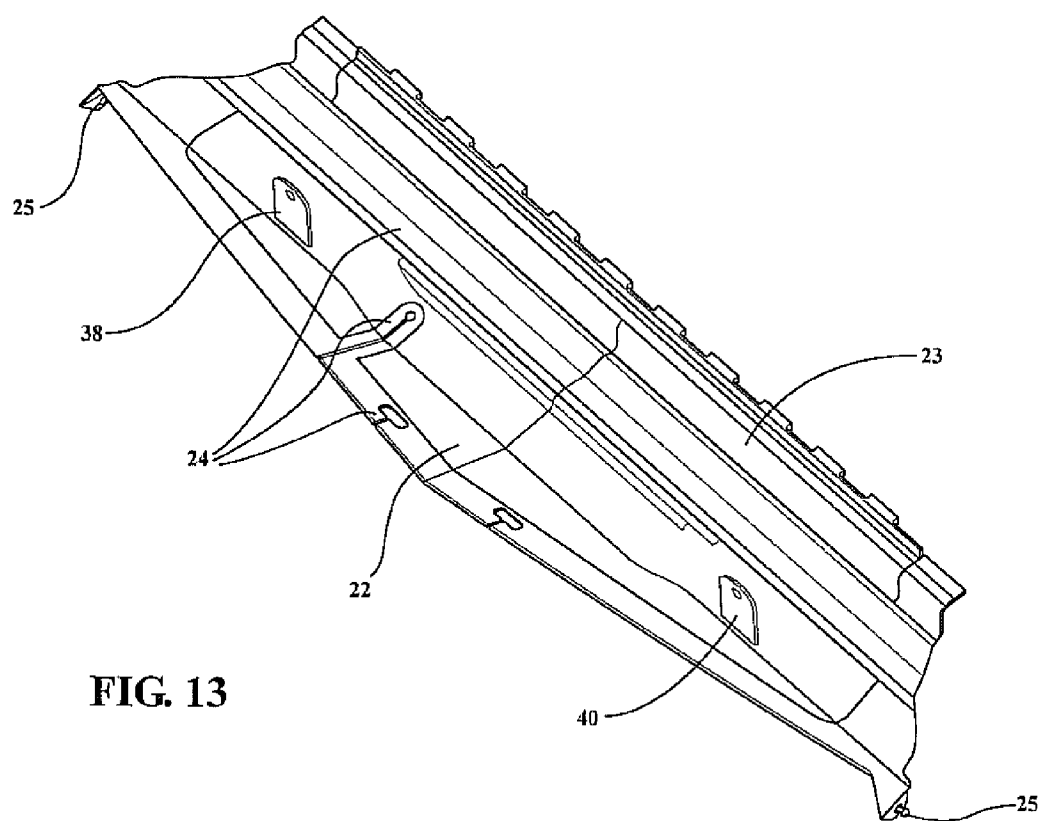
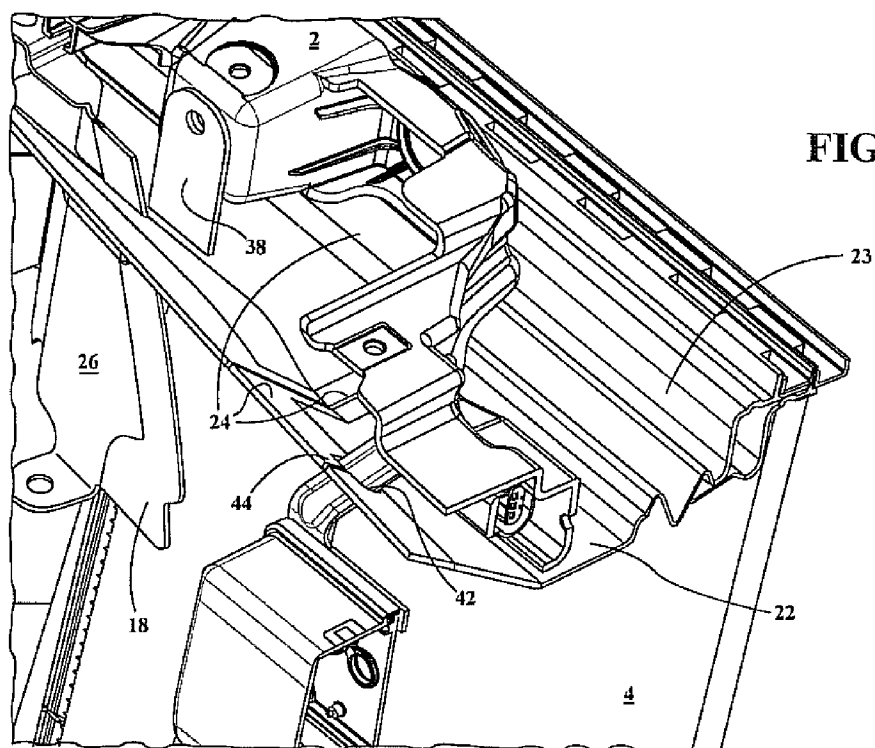


FIG. 13



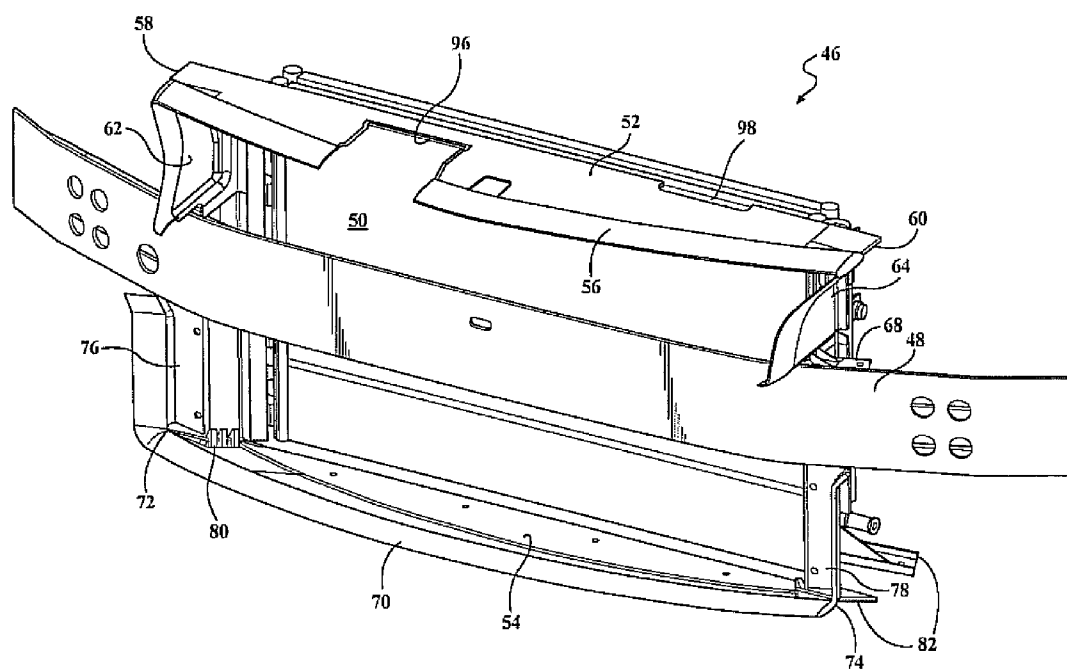


FIG. 15

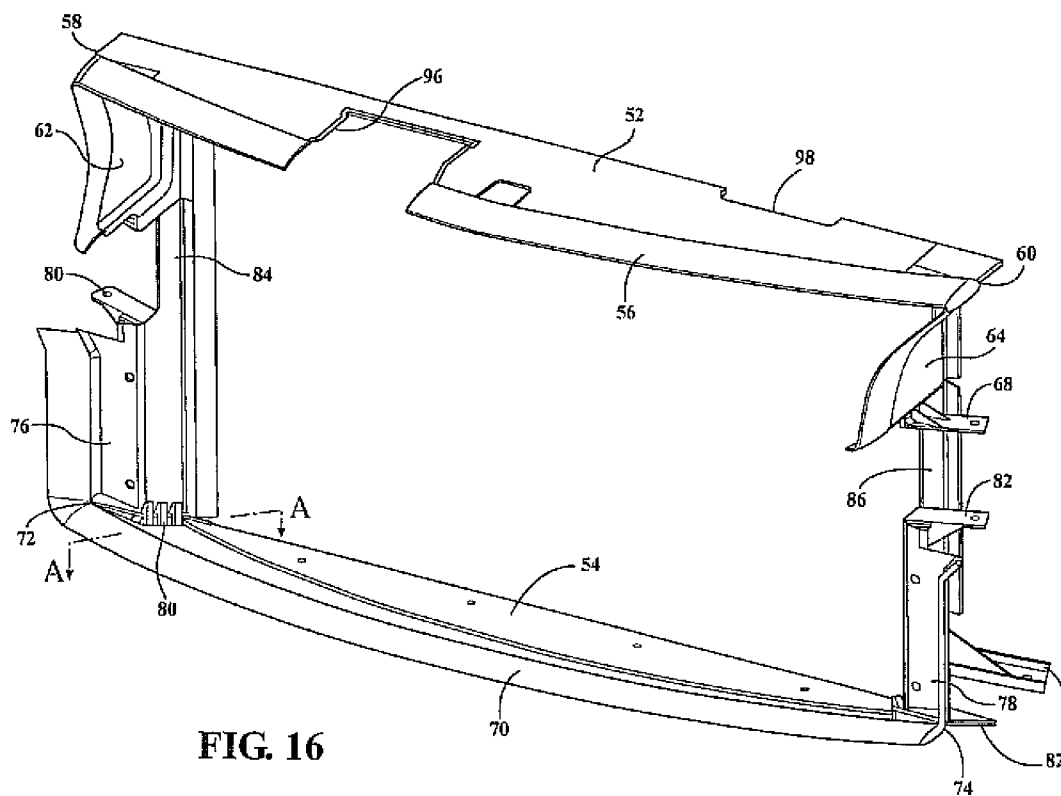


FIG. 16

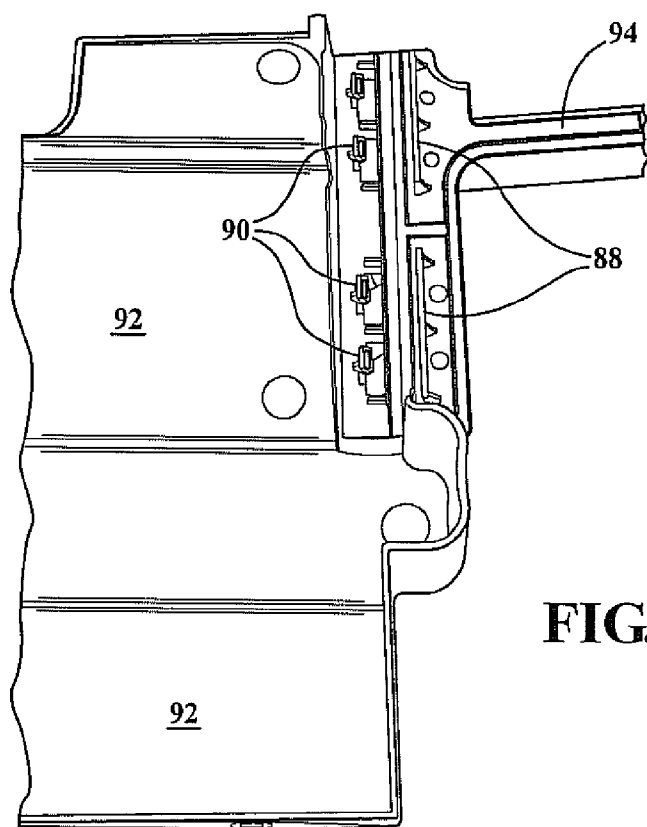
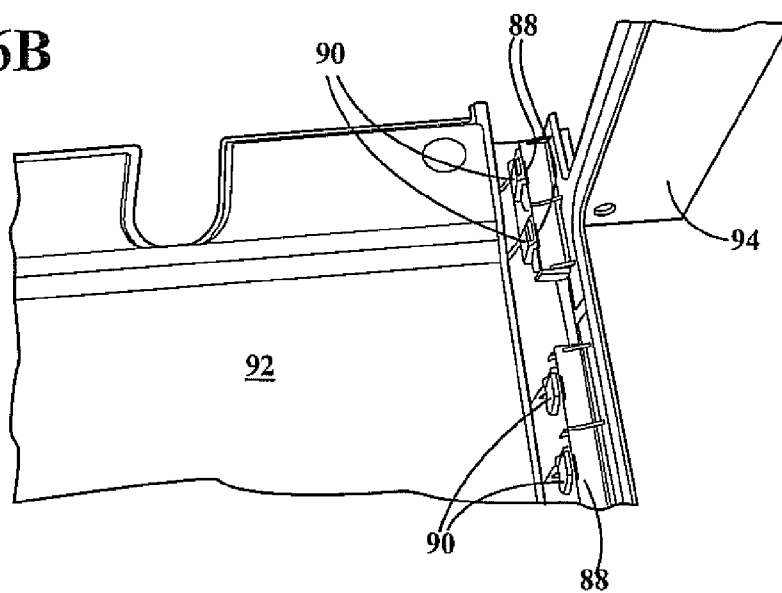


FIG. 16A

FIG. 16B



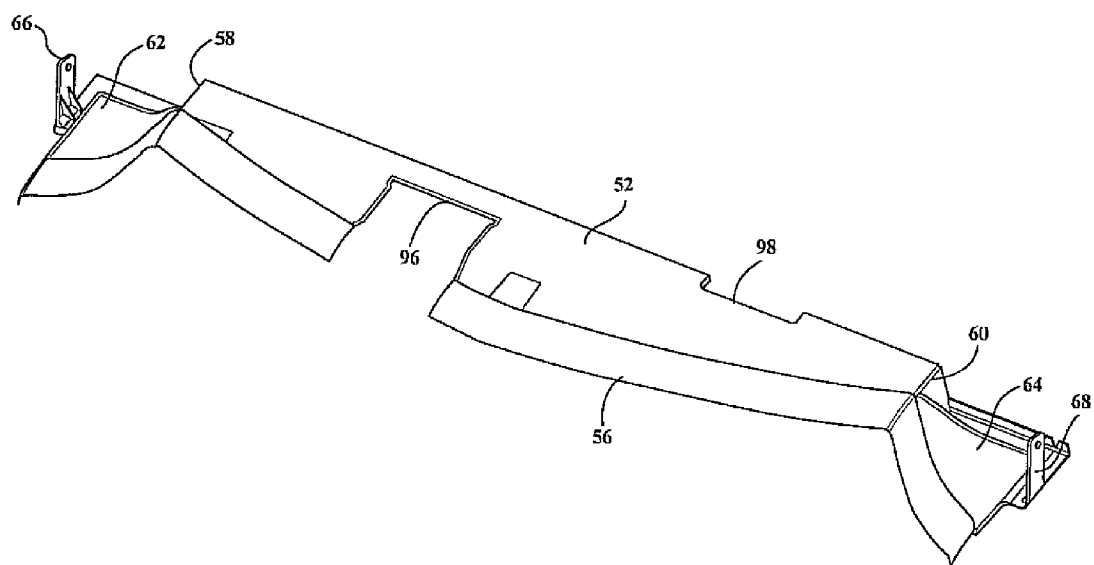


FIG. 17

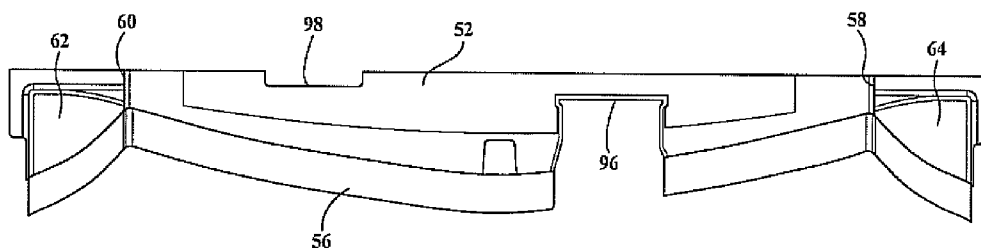


FIG. 18

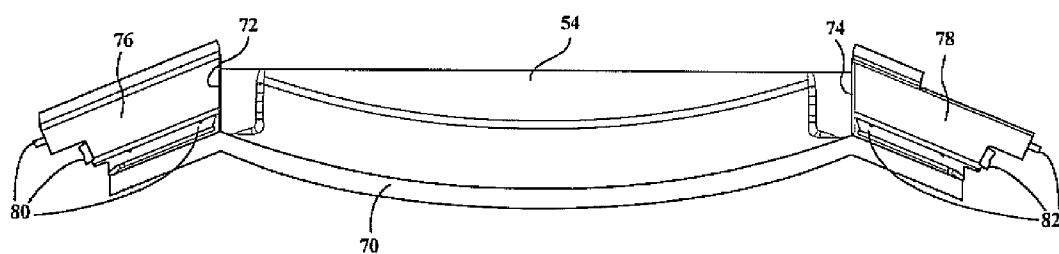
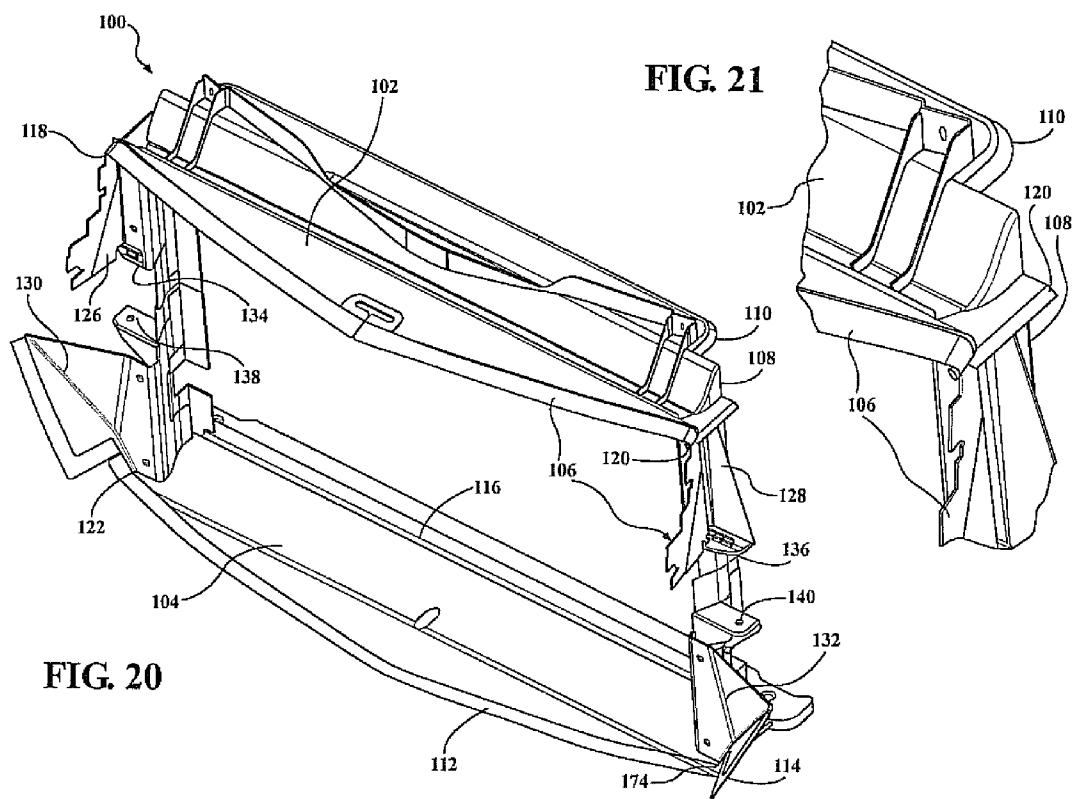
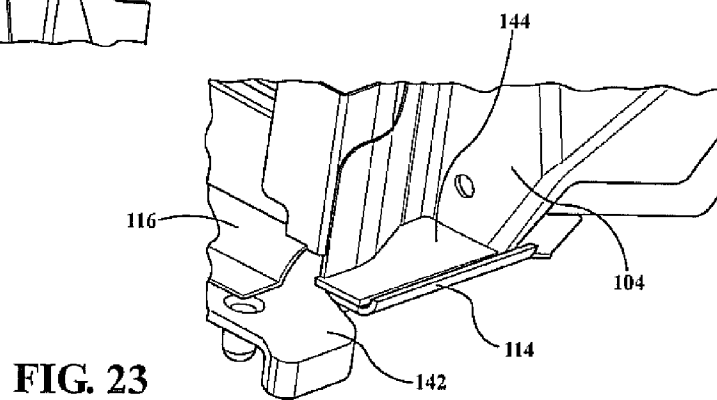
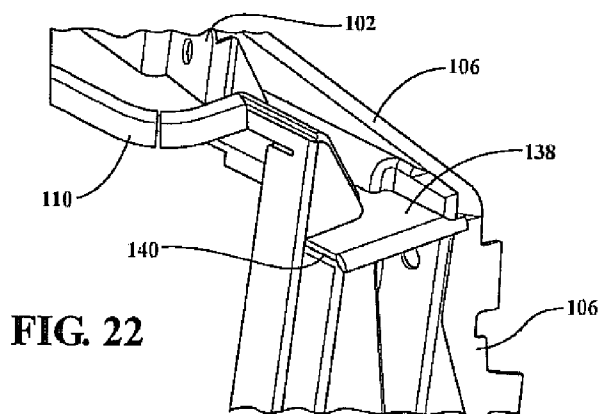


FIG. 19





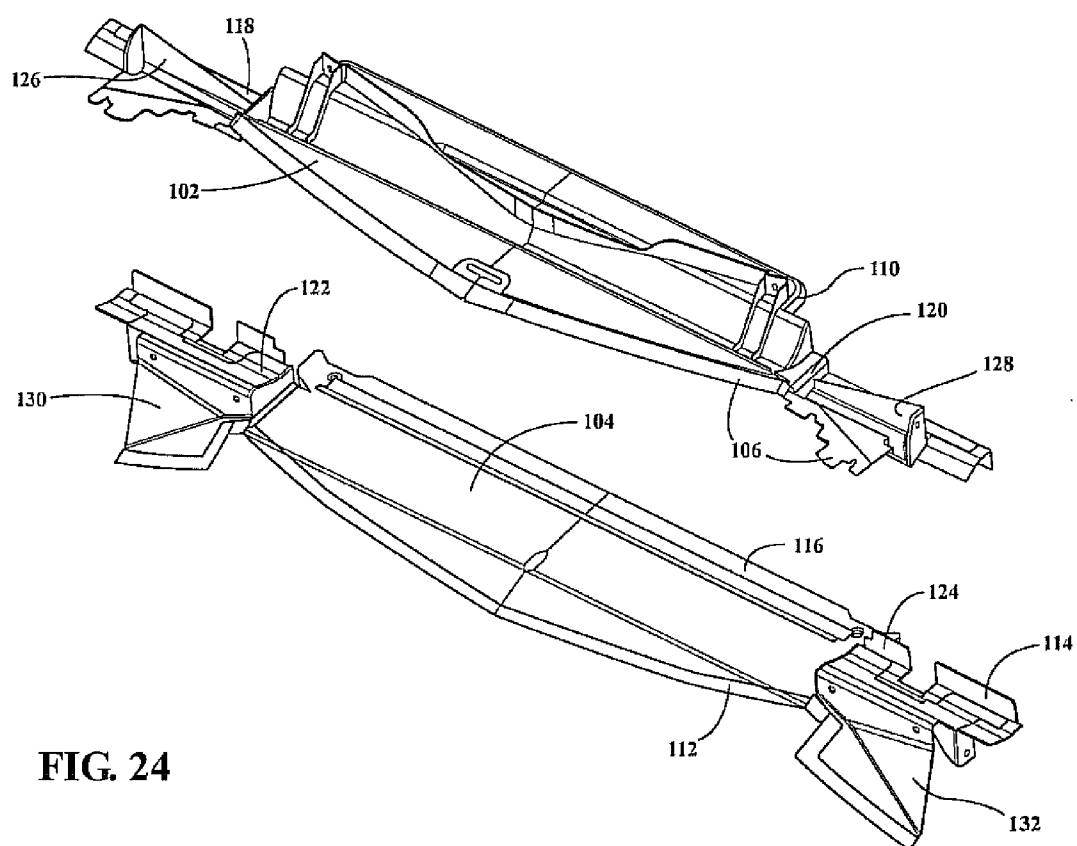
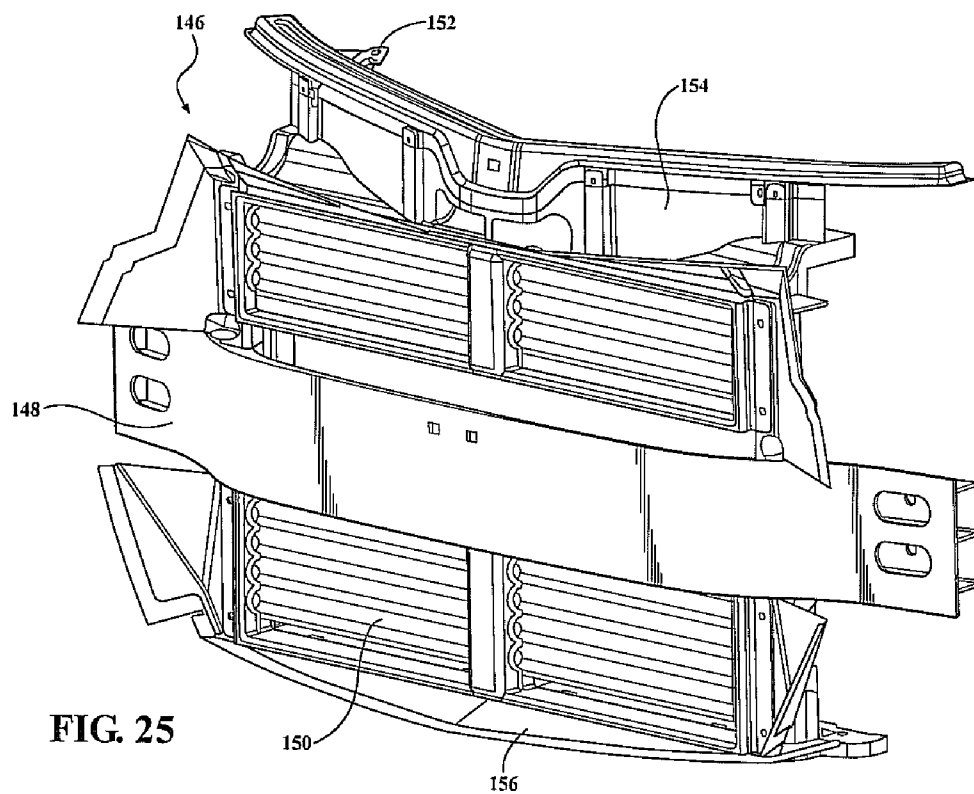


FIG. 24



RECONFIGURABLE FRONT AND UPPER ONE PIECE BAFFLES FOR DIRECTING INCOMING AIR FROM A VEHICLE FRONT FASCIA TO A RADIATOR COOLING MODULE

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This Application is a Continuation-in-part of application Ser. No. 13/726,943 filed on Dec. 26, 2012. application Ser. No. 13/726,943 claims the benefit of U.S. Provisional Application 61/585,196 filed on Jan. 10, 2012, the contents of which are incorporated herein in their entirety.

FIELD OF THE INVENTION

[0002] The present invention discloses an improved baffle design for use with a vehicle radiator and cooling module. More specifically, the invention discloses a multi-sided baffle construction which can include individual and inter-assembleable sides or sections, as well as alternatively contemplating a pair of upper and lower interengaging baffles which collectively establish a four sided and structurally supporting enclosure. Another variant contemplates a three sided lower baffle construction with hinged interconnecting corners, along with a separably attachable top section.

[0003] Each individual length is constructed of a two part/two shot injection molded material including an integrally formed harder body section and softer interconnecting hinge components. In a further series of variants, a number of edge located attachment portions are formed at extending edges of each baffle and which, upon configuring the lengths in perpendicular angled fashion relative one another, enable them to be pre-assembled in a shape retaining and structurally supporting fashion prior to installation within the vehicle compartment around the radiator and associated cooling module. The baffles further include reconfigurable portions to facilitate installation to varying sized and dimensioned vehicle fascias, bumper bars, radiators and the like.

DESCRIPTION OF THE RELEVANT ART

[0004] The prior art is documented with examples of various components designed to baffle or direct incoming air, such as through a fascia opening and into a cooling module or the like. These designs have typically consisted of multi-piece assemblies produced by varying manufacturing methods such as vacuum forming, die cutting, injection molding and two shot molding.

[0005] With newer vehicles focusing on higher levels of aero-efficiency and enhanced mileage, two-shot component assemblies have become preferred which allow a "touch" condition with the surrounding components to better establish a sealing condition. In use with a conventional vehicle radiator, a three piece design with a main baffle and opposite edge connecting and side extending baffles is also known and which includes the requirement of multiple molds, attachment fasteners or other features, and an attendant difficulty in packaging and shipping, in large part owing to its overall "U" shape.

SUMMARY OF THE PRESENT INVENTION

[0006] The present invention teaches a baffle construction constructed of a two part/two shot injection molded material and which includes an integrally formed body having a first

harder panel section and a second softer interconnecting hinge. The two shot material defines a one piece body constructed of a three sided article including a central body panel and two opposite and interconnected side portions.

[0007] The central body panel and side portions each have a specified shape and size and are formed from a first shot harder material including at least an olefinic filled polypropylene. A plurality of living hinges are configured into the body and are located around and between the central panel and interconnected sides. The living hinges each exhibit a specified shape and size formed from a second shot softer material including at least one of a thermoplastic elastomer (TPE) or thermoplastic vulcanite (TPV).

[0008] A secondary article is provided and includes an upper baffle assembled along with the lower baffle to define a four sided box-like structure around the radiator. The upper baffle includes individual harder first shot panel portions, between and around which are formed additional softer second shot hinge and pivot locations. At least one of the three sided article and secondary article further incorporate reconfigurable portions to facilitate installation to varying sized and dimensioned vehicle fascias, bumper bars, radiators and the like.

[0009] A further variant provides a number of edge located attachment portions which are integrated into edge extending locations of each assembleable baffle. The attachment portions include any of a variety of tab and slot or other configurations which, upon configuring the extending attachment portions in perpendicular angled fashion relative one another, enable them to be pre-assembled in a shape retaining and structurally self-supporting fashion prior to installation within the vehicle compartment around the radiator and associated cooling module.

[0010] Advantages of the baffle design include permitting the assembly to be shipped in a single piece lay-flat condition along with their in-molded attachment details, following which the individual baffle profiles are manipulated into position within the engine compartments to acquire its structurally supporting shape. An optional upper baffle can be assembled along with the lower baffle to define a four sided box-like structure around the radiator and likewise includes additional structural details. The upper baffle can likewise include edge extending attachment details for achieving a structurally self-supporting frame configuration about the vehicle radiator. The baffles further include reconfigurable portions to facilitate installation to varying sized and dimensioned vehicle fascias, bumper bars, radiators and the like.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] Reference will now be made to the attached drawings, when read in combination with the following detailed description, wherein like reference numerals refer to like parts throughout the several views, and in which:

[0012] FIG. 1 is a perspective view of a three sided flexible baffle article constructed of a two shot injection molded material including a first harder olefin filled polypropylene bottom and sides and a second softer thermoplastic elastomer or vulcanite hinge material according to the present invention;

[0013] FIG. 2 is an enlarged perspective view of a first side of the baffle and better illustrating the integrated nature of the first and second materials for assisting in foldability and reconfigure-ability such as attachment to an associated vehicle bumper beam;

[0014] FIG. 3 is an enlarged perspective of a middle/bottom component also shown in FIG. 1;

[0015] FIG. 4 is an enlarged perspective view of a second side of the baffle shown in FIG. 1 and, which is substantially mirror opposite to that depicted in FIG. 2, and again illustrating the integrated nature of the first and second materials for assisting in foldability and reconfigure-ability such as attachment to an associated vehicle bumper beam;

[0016] FIG. 5 is a further schematic perspective of the three sided, one piece, two shot flexible baffle design according to the present invention;

[0017] FIG. 6 is an initial pre-assembly view of the three sided flexible baffle article in combination with a separate assembleable upper baffle;

[0018] FIG. 7 is a succeeding and intermediate assembly view in which pivotal flap or wing portions associated with the sides engage, in snap fit fashion, opposite end locations associated with the upper baffle;

[0019] FIGS. 8 and 8A are perspective and enlarged partial completed assembly views in which the upper baffle is hinged and extended to assemble to the main support bracket and the side pivoting flaps are pivoted into engagement with the associated vehicle bumper beam;

[0020] FIGS. 9A and 9B illustrate the baffle upper in each of "as molded" and "extended" positions in order to configure for fitting several different condenser positions and vehicle front fascia designs;

[0021] FIGS. 10A and 10B are isometric views depicting portions of the upper and lower baffles in installed arrangement relative to a vehicle radiator and cooling module;

[0022] FIG. 11 is a further end cutaway view similar to that depicted in FIGS. 10A and 10B and further illustrating the arrangement of the upper and lower baffles relative to the upper cooling module and condenser of the associated radiator;

[0023] FIG. 12 is another illustration of the upper baffle in an initial and "as molded" position as shown in FIG. 9A;

[0024] FIG. 13 is another illustration of the upper baffle in the "extended" position of FIG. 9B;

[0025] FIG. 14 is a rotated iso assembly view similar to that shown in FIG. 11 and which better illustrates the adaptability of the baffle construction for fitting different condenser positions;

[0026] FIG. 15 is an operational view in perspective of a baffle assembly according to a further variant including an associated vehicle bumper beam and front louvered portions associated with the radiator installation;

[0027] FIG. 16 is a simplified perspective of the baffle assembly of FIG. 15 in an in-car position and by which the shape supporting attachment details associated with each interconnecting sides provide structural shape support independent from the engine compartment attachment locations;

[0028] FIGS. 16A and 16B provide a pair of illustrations of a side edge engagement detail established by attachment portions integrated into a hinged edge connection of the baffle assembly, similar to that generally referenced at area A-A in FIG. 16, and by which a first side integrated attachment detail is pivoted from a lay-flat position to an upwardly pivoted and engagement position relative a second bottom integrated attachment detail;

[0029] FIG. 17 is an underside inverted perspective of a lay-flat baffle assembly with bottom and hinged side attachment details according to the variant of FIG. 16;

[0030] FIG. 18 is a detached plan view of the upper baffle shown in FIG. 16;

[0031] FIG. 19 is a detached perspective of a lower baffle shown in FIG. 16;

[0032] FIG. 20 is an operational view in perspective of an assembled baffle according to a yet further variant and depicts edge inter-engaging attachment details associated with a lay-flat bottom and top;

[0033] FIG. 21 is an enlarged upper edge corner detail from FIG. 20 and in which depicts the provision of additional soft material integrated into the harder plastic material with attachment details established between the upper and lower baffles;

[0034] FIG. 22 is a rotated rearward looking upper corner profile of structurally supporting and inter-engaging attachment details from FIG. 20;

[0035] FIG. 23 is a further rotated rearward looking lower corner profile of structurally supporting and inter-engaging attachment details from FIG. 20;

[0036] FIG. 24 is an exploded view of upper and lower baffles according to the variant of FIG. 20 arranged in a lay-flat position such as suitable for shipping; and

[0037] FIG. 25 is an operational view of a structurally assembled baffle, such as depicted in FIG. 20, incorporated into an engine compartment including bumper beam, louver assembly bonded to the structurally assembled baffles on each side, and affixation brackets attached to the vehicle.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0038] Referring initially to FIG. 1, a perspective view is generally depicted at 10 of a three sided flexible lower baffle according to the present invention. In operation, the baffle is fitted underneath and around the sides of a vehicle radiator and which functions, such as in combination with an inter-fitting attachable upper baffle, in order to redirect incoming air through a front vehicle fascia opening and into a cooling module 2 associated with the radiator (see FIGS. 10A-10B, 11 and 13 and which also includes an associated condenser component 4 forming additional structure associated with the vehicle radiator).

[0039] As will be further described throughout the several succeeding views, the baffle 10 is constructed of a one piece, three panel and two port foldable/bendable polymeric material and which further provides the ability to easily reconfigure during installation in order to accommodate numerous different vehicle fascia and radiator condenser mount positions. This is further an improvement over prior art baffle designs which require a plurality of individual side pieces which are assembled together at the time of installation and which do not provide a like degree of modifiability in order to reconfigure to fit varying vehicle fascia and radiator designs.

[0040] As further depicted in succeeding FIGS. 2-4, the lower baffle 10 is provided as a one piece three panel flexible design which is produced in one instance by such as a two shot injection molding or like operation in which harder and multiple/foldable panels are hingedly interconnected by a softer interstitial and boundary defining material. In one non-limiting application, the baffle includes a central body panel 12 and two opposite interconnected side portions 14 and 16 formed from a first shot harder material such as for example an olefinic filled polypropylene.

[0041] A softer interconnecting/boundary defining material 18 is provided by a second shot of softer polymeric

material, such as by non-limiting example a thermoplastic elastomer (TPE) or thermoplastic vulcanite (TPV). The softer material is depicted by a plurality of edge trim and interconnecting portions established and around and between the individual harder plasticized panels **12**, **14** and **16**. For ease and practicality of representation these as shown at **18**, **18'**, **18''** and are represented by spaced apart flexible trim portions in each of repetitive and reverse indicating fashion for sides **14/12** (FIGS. **2**) and **12/16** (FIG. **4**) respectively.

[0042] As further depicted, the second shot (softer) material **18**, **18'** and **18''** extends along interfaces established between each of the panels **12**, **14** and **16** in order to provide inter-flexibility. Additional softer edge trim locations are also defined at **19** (see FIGS. **1** and **5**) in proximity to selected side panels (e.g. at **14**), this in order to provide addition reconfigure-ability of the panel when engaging variously sized fascia and condenser shapes associated with different vehicle models.

[0043] The configuration of the three sided baffle is such that it conveniently ships flat in multiple stacked fashion and, given further that it doesn't need to be assembled in multiple pieces, is further capable of being quickly installed by being conformed or bent into a desired shape for surrounding an existing vehicle radiator. As will also be described in additional detail, the template design associated with the edge profiles of the opposite and flexibility connected sides **14** and **16** is further such that, upon being folded upwardly following pre-positioning of the central interconnecting panel **12** underneath the radiator and during installation, the sides are capable of being quickly reconfigured (if need be) and installed to varying dimensioned vehicle fascias and radiator/condenser configurations.

[0044] Referring to FIG. **6**, an initial pre-assembly view is shown of the three sided flexible baffle article in combination with a separate assembleable upper baffle, further shown at **20** in FIGS. **6** et seq. As shown, additional flexible locations **21** and **21'** are depicted and which facilitate the pivotal folding of wing portions (see as described subsequently at **26** and **28**) associated with each of the side panels **14** and **16**.

[0045] As further depicted, the upper baffle **20** is also provided as a single piece and double shot material including harder first shot components **22** and **22'**, as well as upper spaced and horizontally extending component **23**, around and between which is configured a combined outer perimeter/trim and interior extending second shot (softer) portion **24** for providing the upper baffle with a further measure of flexibility during installation in proximity to and underneath the cooling module **2** (again FIG. **10**).

[0046] During the initial installation sequence, the lower baffle **10** is pressed up onto the lower radiator flange (not shown) by the operator (see opposite and outwardly facing mounting locations **25** associated with the upper baffle **20**), while the upper baffle **20** is hung onto the upper condenser flange **5**. As with the lower baffle **10**, the upper baffle **20** is again shipped flat in multiple stacked fashion, following which it is constructed so that the harder first shot components **22** and **23** (similar to panels **12**, **14** and **16** associated with the lower baffle) are again capable of being bent or angularly positioned relative to the softer perimeter and interior extending trim **24**.

[0047] FIG. **7** is a succeeding and intermediate assembly view in which the pivotal flap or wing portions **26** and **28** associated with the sides **14** and **16** of the lower baffle **10** engage, in snap fit fashion, opposite end locations **30** and **32**

associated with the upper baffle **20**. These side wings **26** and **28** are then swung inwardly on the soft living hinges established by the second shot material and snapped into closed positions utilizing the molded-in snap features.

[0048] The present design allows the side wings **26** and **28** to be maintained out of the way while the chassis design is married to the vehicle body within the assembly plant. During installation, the operator rotates additional portions **34** and **36** associated with the sides **14** and **16** of the lower baffle up and onto the radiator end side tanks (not shown) and then fasten them into position.

[0049] FIGS. **8** and **8A** respectively illustrate both perspective and enlarged partial completed assembly views in which the upper baffle **20** is hinged and extended (see first shot material configured bracket mounts **38** and **40**) to assemble to the main support bracket. Concurrently, the side pivoting flaps or wings **26** and **28** (FIG. **8A**) are pivoted into engagement with the associated vehicle bumper beam (not shown). Following installation of the baffle **20** to the specific vehicle chassis, the pivoting wings **26** and **28** are capable of being easily unsnapped and swung outwardly (see directional arrow in FIG. **8A**), past the bumper beam and pinned into place.

[0050] FIGS. **9A** and **9B** illustrate the upper baffle **20** in each of "as molded" and "extended" positions as respectively depicted (see also FIGS. **12** and **13**). This feature allows one part to be reconfigured (such as any combination of bending and removal of any pieces) in order to configure for fitting several different condenser positions and vehicle front fascia designs.

[0051] FIGS. **10A** and **10B** are isometric views depicting portions of the upper **20** and lower **10** baffles in installed arrangement relative to a vehicle radiator **4** and upper mounted cooling module **2**. The nature of these illustrations is to readily depict the manner in which the baffle components can be easily and quickly manipulated via bending, folding or trimming away of selected template portions, in order to install underneath and around both the cooling module **2** and associated radiator condenser **4** and associated bracketry.

[0052] FIG. **11** is a further end cutaway view similar to that depicted in FIGS. **10A** and **10B** and further illustrating the arrangement of the upper **20** and lower **10** baffles relative to the upper cooling module and condenser of the associated radiator. The cross sectional view shown best illustrates the manner in which the installation configuration of the upper baffle **20** operates to direct engine air flow downwardly to the cooling module during flow of the same continuously through the front fascia.

[0053] FIG. **14** is a rotated iso assembly view similar to that shown in FIG. **12** and which better illustrates the adaptability of the baffle construction for fitting different condenser positions. Also shown in better detail is both the configuration and manner in which the combination of harder (first shot) portions **22** and **23** and softer second shot **24** locations are collectively manipulated in order to install the upper baffle above the radiator condenser in supporting fashion around and underneath the associated cooling module **2**. The configuration of the softer material edge profile with cutout incisions is also better shown, such as depicted at **42** and **44** in FIG. **14**, and which facilitates fast and easy installation around such as bracketry and wire harness locations associated with the vehicle architecture.

[0054] The flexible two shot baffle design in use assists in providing more aerodynamic efficiency and enhanced mileage of associated vehicle installations by establishing a

“touch” condition whereby the two shot component assemblies contact critical locations along the radiator bracketry and upper located cooling module to optimize desired airflow with the surrounding components and thereby establish proper sealing where desired. As previously discussed, the softer second shot material provides living hinge locations to facilitate bending and manipulation of the harder first shot panel locations around, behind and under the radiator and associated vehicle architecture during loading/installation.

[0055] As such, the resulting two shot created part requires only one mold for creation and subsequent installation into a variety of vehicle applications. This is further accommodated by designing various template post mold “punch out” locations (see such as previously again shown at **18'** in FIG. **1**), this allowing for quick adaptation of a given baffle into different versions required for model differences and engine options.

[0056] Also, and as again previously noted, the ability to produce both the lower and upper baffles **10** and **20** in a substantially flattened profile allows for ease of multiple shipping. As further noted, the lower and upper baffles can be employed separately or in combination in order to tailor the application for optimization of vehicle sealing and aerodynamic airflow.

[0057] Referring now to FIG. **15**, an operational view is generally shown at **46** in perspective of a baffle assembly according to a further variant and which is depicted in an environmental installation within a vehicle engine compartment, such as which can include an associated vehicle bumper beam **48** and front louvers **50** associated with the radiator installation. As previously described, the variants collectively presented in each of FIGS. **15-25** depict non-limiting examples of assembleable baffle constructions, such as which can be shipped in an initially lay-flat condition, and which incorporation attachment portions or details.

[0058] As will be further described in further detail, and upon pivoting the interconnecting portions of the individual bodies or sections into position and subsequently engaging the attachment portions to one another, the body creates an enclosing and self-supporting framework for installation within the vehicle engine compartment for various under-hood assemblies, such as including active shutter assemblies. The ability to ship the baffle bodies in a lay flat condition, combined with the ability to inter-assemble the bodies into a hinged and structurally self-supporting fashion without the need for additional metal structural supports or brackets, provides both greater functionality and cost savings.

[0059] FIG. **16** is a simplified perspective of the baffle assembly of FIG. **15**, such as is arranged in an in-car position and which includes a first multi-sided upper baffle **52** and a second multi-sided lower baffle **54**. As further depicted in detached sectional views FIGS. **17-19**, the upper baffle **52** incorporates a structurally supporting and harder material, with a trim extending softer material **56**. A pair of hinged locations, at **58** and **60**, separate a main or central panel of the upper baffle **52** with wing or side extending portions **62** and **64**.

[0060] The harder and softer materials can be formed in a two shot molded fashion as previously described and can include the same constructions, such as a harder olefinic filled propylene matched with either of a thermoplastic elastomer or a thermoplastic vulcanite. As shown, the softer trim extending material **56** can extend beyond the hinged locations **58** and **60** into the sides **62/64**, such as further incorporating

additional harder materials into which are configured inter-attachment portions or details (see for example at **66** and **68** for upper baffle **52**) for providing structural self-supporting assembly of the baffle construction, this independent from the engine compartment attachment locations (not shown).

[0061] Referring again to FIG. **16** in combination with FIG. **19**, the lower baffle **54** is similarly constructed and includes a harder structurally supporting material with a trim extending softer material **70**. A pair of opposite side hinges **72** and **74** separate a main or central panel of the lower baffle **54** with sides or wings **76** and **78**, these again incorporating a harder material and exhibiting end-most attachment portions or details, further at **80** and **82**, for facilitating inter-assembly of the upper **52** and lower **54** baffles into the assembly configuration of FIG. **16**. Without limitation, it is understood that the nature and arrangement of the attachment details is such that the individual bodies associated with each baffle can be engaged directly together or to an intermediate and structurally supporting component such as associated with the framing assembly (see at **84** and **86** in FIG. **16**), which in turn facilitates installation of the bumper beam, louvers, and the like.

[0062] Referring now to FIGS. **16A** and **16B**, provided are a pair of illustrations of a side edge engagement detail scheme established by attachment portions **88** and **90** integrated into a hinged edge connection **90** of a baffle assembly. This is representatively similar to that generally referenced at area A-A in FIG. **16**, and by which a first side integrated attachment detail (depicted by perpendicular extending lip edges **88**) is pivoted from a lay-flat position (FIG. **16A**) to an upwardly pivoted and engagement position (FIG. **16B**) relative a second bottom integrated attachment detail depicted by a plurality of biasing clips or tangs **90**.

[0063] As further shown in FIG. **16B**, pivoting of the side or wing of the baffle which incorporates the selected attachment details **88** (for purposes of ease of illustration much of the supporting structure including the softer trim defining materials associated with the main panel and wing or side portions is removed) allows for quick three dimensional assembly of the main or central panel, shown at **92**, with the hinged supported side panels, further at **94**. As further previously described, both the upper **52** and lower **54** baffles can include reconfigured (or reconfigurable) portions such as further depicted by configurations **96** and **98** associated with the upper baffle **52** and which are intended to readily adapt the baffle construction to a given engine compartment architecture, such as including the ability to quickly modify a template baffle to fit within a variety of different vehicle compartments.

[0064] Proceeding to FIG. **20**, an operational view is depicted in perspective at **100** of an assembled baffle according to a yet further variant and depicts edge inter-engaging attachment details associated with lay-flat top (or upper) **102** and bottom (or lower) **104** bodies. As with the variant previously described in FIGS. **15-19**, the upper body **102** again includes a harder structurally supporting material with additional softer extending trim portions, these further shown at **106**, **108**, **110**, et seq. and which are depicted as extending from both forward and rearward edges of the body. The softer sections are usually required for establishing a sealing overlap condition upon erecting and attaching the framing configuration.

[0065] The lower body **104** (as also depicted in FIG. **24**) likewise includes a similar arrangement of softer sections

112, 114, 116 et seq., and which extend from front, rear, side and intermediate surfaces of the structurally supporting main body. As in the previously disclosed variant **46**, the upper **102** and lower **104** bodies each include edge extending hinges (see at **118** and **120** for upper body **102** and further at **122** and **124** for lower body **104**), these further incorporating side or wing extending portions, i.e. further at **126/128** for upper body **102** and **130/132** for lower body **104**.

[0066] Additional attachment details are provided, at **134/136** for upper body **102** and **138/140** for lower body **104** (see FIG. **20**) incorporated into the hardened structural locations of the individual bodies and which permit converting from the lay-flat position of FIG. **24** to the three dimensionally configured and structurally assembled position of FIG. **20**. As previously described, the individual bodies can be connected in end-to-end engaging fashion or can be secured to other and additional structural details associated with the desired engine compartment installation.

[0067] FIG. **21** is an enlarged upper edge corner detail from FIG. **20** and in which depicts the provision of the additional soft material sections **106, 108, 110**, et seq., integrated into the harder plastic material of the upper body **102**, this in combination with the attachment details better shown in FIG. **20** (e.g. at **136**) established between the upper and lower baffles. FIG. **22** is a rotated rearward looking upper corner profile of structurally supporting and inter-engaging attachment details from FIG. **20** and depicting a further engaging profile including hingedly seating ledges (at **138** and **140**) which are pivoted into contact to provide a shouldered edge supporting location. FIG. **23** is a further rotated rearward looking lower corner profile of the structurally supporting and inter-engaging attachment details from FIG. **20**, in particular showing a pair of hingedly converted and overlapping ledge details, at **142** and **144**, associated with a reverse side of the lower body **104**.

[0068] Finally, FIG. **25** is an operational view of a further example, generally at **146**, of a structurally assembled baffle, such as depicted in FIG. **20**, and incorporated into an engine compartment including bumper beam **148**, louver assembly **150** bonded to the structurally assembled baffles on each side, and affixation brackets **152** for affixing the assembled baffle within the vehicle. As in the previous variants, the baffle construction can include such as a pair of upper **154** and lower **156** multi-sided and inter-assembleable bodies, each of these further incorporating any arrangement of harder structurally supporting materials, combined with softer trim extending and hinge defining portions. The louver assembly **150** as shown can be bonded to the baffles on each side and the upper **154** and lower **156** bodies can again be pre-mounted to intermediate structural support locations (or alternatively can be reconfigured for mounting directly to each other) and in order to establish an enclosed self-supporting profile.

[0069] Having described our invention, other and additional preferred embodiments will become apparent to those skilled in the art to which it pertains, and without deviating from the scope of the appended claims.

We claim:

1. A baffle construction comprising:

at least two individual bodies each constructed of a two part injection molded material, at least one of said bodies including a harder material incorporated into a panel section and a plurality of second softer materials incor-

porated into each of a trim extending section and at least one end extending and interconnecting hinge section; and

a plurality of attachment portions constructed of said harder material and incorporated into each of said bodies, at least a sub-plurality of said attachments being formed into said hinge sections enabling pivoting of said attachments of a selected body into an engaging relationship along with additional attachments associated with another body to create an enclosing and self-supporting framework for installation within a vehicle engine compartment.

2. The baffle construction as described in claim **1**, at least one of said bodies further comprising a central panel and two opposite interconnected sides.

3. The baffle construction as described in claim **1**, said bodies each having a specified shape and size with said first harder material further comprising at least an olefinic filled polypropylene.

4. The baffle construction as described in claim **2**, further comprising a plurality of living hinges located around and between said central panel and said sides.

5. The baffle construction as described in claim **4**, said living hinges each having a specified shape and size and being formed from said second softer material including at least one of a thermoplastic elastomer (TPE) or thermoplastic vulcanite (TPV).

6. The baffle construction as described in claim **2**, at least another of said bodies further comprising an upper baffle assembled along with said lower baffle to define a four sided box-like structure around the radiator.

7. The baffle construction as described in claim **6**, at least one of said bodies incorporating reconfigurable portions which are configured to facilitate installation to any of varying sized and dimensioned vehicle fascias, bumper bars and radiators.

8. A multi-sided and lay flat baffle construction for installation within an engine compartment of a vehicle, comprising:

at least one multi-sided body including a central panel and opposite interconnected side panels;

said body constructed of a two part injection molded material including a harder structurally defining material and a softer material, said softer material incorporated into interconnecting hinges between and around said panels; and

a plurality of attachment portions constructed of said harder material and incorporated into said body, at least a sub-plurality of said attachment portions being formed into said hinge sections enabling pivoting of said body into an enclosure defining configuration, whereupon said attachment portions are inter-engaged to one another to create a self-supporting framework for installation within a vehicle engine compartment.

9. The baffle construction as described in claim **8**, said harder material having a specified shape and size and being formed from at least an olefinic filled polypropylene.

10. The baffle construction as described in claim **9**, said softer material further comprising a plurality of living hinges located around and between said central panel and said sides.

11. The baffle construction as described in claim **10**, said living hinges each having a specified shape and size and being formed from at least one of a thermoplastic elastomer (TPE) or thermoplastic vulcanite (TPV).

12. The baffle construction as described in claim **8**, further comprising an upper body assembled along with said multi-sided body to define a four sided box-like structure around the radiator and upper cooling module.

13. The baffle construction as described in claim **12**, said upper body further comprising individual harder panel portions, between and around which are formed additional softer hinge and pivot located portions.

14. The baffle construction as described in claim **13**, at least one of said bodies incorporating portions which are configurable to facilitate installation to any of varying sized and dimensioned vehicle fascias, bumper bars, and radiators.

15. A multi-sided baffle construction for installation within an engine compartment of a vehicle, comprising:

a pair of bodies, each including a central panel and opposite interconnected side panels, said bodies being constructed of a two part injection molded material including a first structurally defining and harder material and a second softer material;

said softer material defining interconnecting hinges between and around said harder material;

a plurality of attachment portions constructed of said harder material and incorporated into each of said bodies, at least a sub-plurality of said attachments being

formed into said hinge sections enabling pivoting of said attachments into an inter-engaging relationship to create an enclosing and structurally self-supporting framework for installation within a vehicle engine compartment.

16. The baffle construction as described in claim **16**, said structurally defining material further comprising an olefinic filled polypropylene.

17. The baffle construction as described in claim **15**, said softer material further comprising a plurality of living hinges located around and between said body and side portions.

18. The baffle construction as described in claim **17**, said living hinges each having a specified shape and size and being formed from at least one of a thermoplastic elastomer (TPE) or thermoplastic vulcanite (TPV).

19. The baffle construction as described in claim **17**, at least one of said bodies incorporating portions which are configurable to facilitate installation to any of varying sized and dimensioned vehicle fascias, bumper bars, and radiators.

20. The baffle construction as described in claim **15**, further comprising brackets extending from said structurally self-supporting framework for securing within the engine compartment in order to configure said framework around a radiator.

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