UNITIZED MULTI-LAYERED GASKET AND METHOD OF MAKING SAME.

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US-A- 4 387 904
US-A- 4 648 607

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Description

Technical Field

This invention generally relates to gasket assemblies and, more particularly, to a unitized gasket, especially for internal combustion engines, formed of multi-layered construction and a process for making same.

Background of the Invention

Although the mating surfaces or pairs of surfaces to be sealed, such as an automotive engine block and a mating surface on an exhaust manifold, appear to be smooth and flat, most frequently they are not sufficiently smooth to provide an effective seal. Accordingly, a gasket is required to be placed between to provide an effective seal against escaping fluids, such as gas vapors.

Multi-layer gasket assemblies are becoming more popular for use with automobile engines. Such a gasket assembly is comprised of two or more layered gasket pieces which are typically welded or riveted to each other. Each gasket piece may be similar in size and overall configuration to other gasket pieces used in the same assembly. Each piece can, however, include details which distinguish it from the other gasket pieces. That is, albeit similarly outlined or configured, one gasket piece may have one or more embossments provided thereon while another similarly outlined gasket piece in the same gasket assembly may have different embossments or other features provided thereon. Additionally, for example, one gasket piece in the assembly may be substantially flat while another gasket piece in the same assembly can include a flow tube extending from a source opening provided in that gasket piece.

Production of multi-layered gaskets typically comprises multiple steps or manufacturing processes. First, because each piece comprising the gasket assembly may be uniquely designed, individualized gasket pieces are mass produced, as by a stamping or blanking process. That is, steel or other suitable gasket material is continuously fed to a machine which stamps or blanks out individual gasket pieces having specific configurations. In the next step, these individual gasket pieces are separately processed, as by heat treating, etc. Then, the individualized gasket pieces are layered in a specific order and are, subsequently, assembled in that order. The individual pieces forming the gasket assembly are usually held together as an assembly, as with rivets or spot welding. After the separate gasket pieces are joined together as a complete assembly, the resultant gasket is inspected for accuracy and compliance.

It is critical that each piece comprising the gasket assembly is layered in its proper order. Otherwise, the gasket assembly is likely to fail. Because the pieces comprising the gasket assembly may all be similar in size and overall configuration, assembly of the gasket can easily be done incorrectly. That is, gasket pieces may be arranged in an improperly layered order. Alternatively, and because the gasket pieces are individually manufactured, placed together, and then assembled, two of the same gasket pieces may be inadvertently assembled together. A myriad of other inadvertent yet incorrect combinations of gasket pieces is conceivable. Although inadvertent, such improper combinations or arrangements of the various gasket pieces can result in gasket failure.

US-A-4 648 807 discloses a steel laminate gasket with assembly order identification device comprising a plurality of thin steel plates to be stacked one after another, and means for identifying position of the steel plates formed on the steel plates where sealing ability is not affected. Said means, when the steel plates are stacked in a proper order, forming a stepped portion with different height relative to a predetermined horizontal plane of the gasket to thereby a user to notice the proper order of assembly of the gasket.

US-A-4 387 904 discloses a gasket for sealing the joint between the cylinder head and exhaust manifold of an internal combustion engine. This gasket comprises a flat sheet metal base layer having at least one opening corresponding to the number of cylinder head and exhaust manifold ports around which a seal is required. A second layer in the form of a radially corrugated metal annulus applied to the base layer around the opening is provided, with the radially inner parts of the annulus spaced apart from the base layer around the opening and a sheet metal layer which increases the thickness of the base layer in regions of the base layer which surround securing stud apertures therein. The layer may be formed by folding over the base layer sheet or alternatively it may be a separately attached sheet metal layer.

US-A-2 034 610 discloses a gasket comprising two outside and one or more inside laminations of sheet metal. Those laminations have aligned apertures providing an opening therethrough. The material of one outside lamination extends through such opening and being turned over against the face of the opposite outside lamination. The total thickness of the inside laminations between the first outside lamination and the turned over portion thereof immediately adjacent said opening is less than the thickness of the inside laminations at a point outside of the turned-over portion by an amount approximately equal to the thickness of said turned over portion.
It is an object of the present invention to improve a multi-layered gasket and a process for making same in such a manner that each gasket can repeatably be comprised of the same component pieces and that the layered orientation of each gasket section is fixed with respect to the other gasket sections.

The present invention achieves this object by the features disclosed in claims 1, 10, 13 and 15.

Summary of the Invention

In view of the above, and in accordance with the present invention, there is provided a multi-layered gasket comprising a gasket body including multiple interconnected gasket sections. In a preferred form, the gasket body includes at least two gasket sections, with each gasket section defining a service opening and at least one relatively small aperture. A peripheral edge of a first of the gasket sections is interconnected with a peripheral edge of a second of the gasket sections in a manner allowing the first gasket section to be folded into an overlying engaging relationship with the second gasket section, with the aperture and service openings being in alignment.

In one form, the first and second gasket sections are integrally formed, as of metal, and are general coextensive. Moreover, at least one of the gasket sections defines a projecting embossment encircling the service opening defined by the gasket section. One or more bridges, which can be integral extensions of one of the gasket sections, serve to interconnect the gasket sections.

In another form of the invention, the gasket body includes a third gasket section. Bendable metallic bridges interconnect this third gasket section with the gasket body. Alternatively, the three gasket sections can be integrally formed along with the bridges interconnecting the gasket sections. Each gasket section can also include indicia for indicating an overlying relationship order for the gasket sections. The three gasket sections can be folded into an overlying relationship with each other in an accordion-like fashion with the apertures in the overlying sections being substantially aligned with each other. The various gasket sections are each foldable along fold lines defined by the gasket body at peripheral edges of the gasket sections after the sections are folded upon each other.

In a preferred form of the invention, one or more bendable closing tabs extend from at least one of the gasket sections. If so desired, such closing tabs can be integrally formed with one of the gasket sections. Such closing tabs can be manipulated to retain such gasket sections in an overlying engaging relationship relative to one another.

In accordance with the present invention, a method for making such a gasket involves providing multiple interconnected gasket sections with each gasket section defining a service opening and a relatively small aperture. A preferred method involves providing at least two interconnected gasket sections. An alternative method involves providing at least three interconnected gasket sections. The gasket sections may be integrally formed of metal.

Making a unitized multi-layered gasket according to the present invention further involves folding a first of the gasket sections into an overlying engaging relationship with a second of the gasket sections. The gasket sections are folded along a fold line defined at a peripheral edge of each gasket section after one gasket section is folded upon the other gasket section.

In those embodiments where three interconnected gasket sections are provided, the sections are preferably folded in an accordion relationship relative to each other.

The making of a multi-layered gasket can further involve providing an encircling embossment about each of the service openings on at least one of the gasket sections. The encircling embossments are formed on the gasket sections before they are folded upon each other.

Other steps involved with a method of forming a unitized gasket according to the present invention involve providing bendable closing tabs on at least one of the gasket sections and closing the tabs. Closing the tabs serves to retain the gasket sections in the folded accordion relationship relative to each other.

Because the gasket sections are interconnected to each other, they cannot become separated from each other. As such, the above-considered design assures repeatability and also proper gasket construction. That is, because the sections comprising the gasket are inseparable from one another, only the proper pieces are incorporated in each gasket assembly. Therefore, each gasket will repeatably be comprised of the same component pieces.

Moreover, because the gasket sections are interconnected, the layered orientation of each gasket section is fixed with respect to the other gasket sections. Because each section is folded or bent upon its adjacent gasket section, a proper layering order is assured. In this regard, and if desired, the gasket sections may be provided with indicia indicating an overlying relationship order for the gasket sections.

The manufacturing method involved with the present invention is most efficient and minimizes human error and labor involvement. Thus, a continuous roll of gasket material may be fed into a
machine and a finished gasket would be automatically processed and formed thereby avoiding the possibility of inadvertent assemblage. As will be understood, the contemplated design minimizes in-process inventory, labor, material handling, and warehousing costs. If the gasket sections are, as is contemplated, integrally formed by a progressive die assembly from a single sheet of rolled stock, there is also a savings of set-up time for the machinery used to stamp or blank out the gasket sections. Rather than having to use multiple presses and die assemblies for producing multiple separate blanks, the design contemplated by the instant invention would require only one die assembly. Clearly, die cost would also be lower when only one die assembly is used as compared to multiple die assemblies which would be required if separate gasket blanks were to be used in making a gasket.

Other features and advantages of the present invention will become readily apparent from in the following detailed description, the appended drawings, and the accompanying claims.

**Brief Description of the Drawings**

FIGURE 1 is a top plan view of a unitized multi-layered gasket embodying principles of the present invention and showing the gasket prior to folding;

FIGURE 2 is a bottom plan view of the gasket of FIGURE 1;

FIGURE 3 is a cross-sectional view taken along line 3-3 of FIGURE 1;

FIGURE 4 is an enlarged view of an area encircled in FIGURE 1;

FIGURE 5 is a top plan view of the gasket of FIGURE 1 having a first gasket section folded into an overlying and engaging relationship relative to another gasket section of the gasket;

FIGURE 6 is a bottom plan view of the gasket shown in FIGURE 5;

FIGURE 7 is a cross-sectional view taken substantially along line 7-7 of FIGURE 5;

FIGURE 8 is a top plan view of the gasket of FIGURE 1 wherein each gasket section is accordion folded;

FIGURE 9 is a bottom plan view of the gasket of FIGURE 8;

FIGURE 10 is a cross-sectional view taken substantially along line 10-10 of FIGURE 8;

FIGURE 11 is an enlarged fragmentary cross-sectional view taken substantially along line 11-11 of FIGURE 8; and

FIGURE 12 is a view like FIGURE 10 but of a further embodiment of this invention.

**Detailed Description of A Presently Preferred Embodiment**

While the present invention is susceptible of embodiment in various forms, there is shown in the drawings a presently preferred embodiment hereinafter described, with the understanding that the present disclosure is to be considered as an exemplification of the invention and is not intended to limit the invention to the specific embodiment illustrated.

Referring now to the drawings, wherein like reference numerals indicate like parts throughout the several views, there is shown in FIGURE 1 a unitized multi-layered gasket 10 arranged in an unfolded configuration. When assembled in its operative condition, the gasket 10 is adapted to be disposed, in known manner, between a pair of surfaces to be sealed, such as between an engine block and a multiported manifold of an internal combustion engine and is compressed therebetween. The details of the engine per se, which may be of various forms, form no part of the present invention, except that a gasket embodying the principles of the present invention will be configured as dictated by the particular engine with which it is to be used, and will be proportioned to accommodate to the openings and surfaces in the block and manifold with which the gasket assembly is to be used and which the gasket assembly is to seal.

Referring now to FIGURES 1 and 2, the gasket 10 comprises a gasket body 12 including multiple gasket sections 14, 16 and 18. Although three gasket sections are illustrated, it will be appreciated and understood that more than three gasket sections could be provided without departing from the spirit and scope of this invention. In the preferred embodiment, each gasket section is formed of metal.

Each gasket section has certain features which are common amongst them. Those features which are common will be described referring to gasket section 14 but with the understanding that the other gasket sections include the same or similar features. Each gasket section defines a first, generally planar main surface 20 (FIG. 1) and a second generally planar main surface 22 (FIG. 2). Surfaces 20 and 22 are generally parallel to each other. Where, as here, there are at least three gasket sections, it is preferred that each gasket section be about 0.2032 mm (about 0.008 inch) thick, but the gasket sections may range in thickness from about 0.127 mm (about 0.005 inch) to about 0.508 mm (about 0.020 inch). Where there are only two gasket sections, or the application otherwise permits, the gasket sections may range from about 0.127 mm (about 0.005 inch) to about 1.106 mm (about 0.040 inch). Moreover, each gasket section defines one
or more relatively large, clear-through service openings 24 and one or more relatively small apertures 26. The smaller apertures 26 may define bolt holes through which clamping bolts (not shown) may pass.

The gasket body 12 is preferably die cut or blanked out, such as with a stamping machine, punch press, or other suitable form of equipment to provide the requisite configuration to the gasket body 12. In the preferred form of the invention, multiple gasket sections 14, 16 and 18 are integrally formed from a single sheet of material during the stamping or punching process. As such, each section is of the same material but can be different in shape. The sections may be continuous or may be segmental.

As illustrated, gasket section 14 defines encircling embossments 28 arranged about each service opening 24. Embossments 28 are formed in a known manner as by pressing them into the planar sheet of which gasket section 14 may be formed. The sealing embossments may be of varying depths and dimensions depending upon gasket's use.

As is best shown in FIGURE 3, embossments 28 comprise a projecting portion or projection 30 extending outwardly from the main or major surface 22, and a corresponding indentation, recess or cavity 32 which extends inward from major or main surface 20.

As illustrated, gasket section 14 further defines encircling embossments 34 arranged about certain of the bolt holes 26. The embossments 34 are formed in a known manner as by pressing them into the planar sheet from which the gasket section may be formed. The sealing embossments may be of varying depths and dimensions depending upon the gasket's use.

As is best shown in FIGURE 3, embossment 34 comprises a projecting portion or projection 36 extending outwardly from major or main surface 22, and a corresponding indentation, recess, or cavity 38 which extends inward from major or main surface 20. Each of the embossments 34 are of similar construction.

As illustrated, gasket section 16 defines encircling embossments 29 arranged about each service opening 24. Embossments 29 are formed in a similar manner to embossments 28 as by pressing them into a planar sheet of which gasket section 16 may be formed.

As best shown in FIGURE 3, embossments 29 comprise a projecting portion or projection 31 extending outwardly from the main or major surface 20, and a corresponding indentation, recess, or cavity 33 which extends inward from major or main surface 22. The embossments 29 are arranged on gasket section 16 in an inverse manner to the embossments 28 arranged on gasket section 14. As such, and as seen in FIGURE 6, when one gasket section is folded upon the other, embossments 28 and 29 are arranged in a complementary fashion.

As illustrated, gasket section 18 defines a series of flow tube formations 40 which are provided to improve the flow of exhaust gases through service openings 24. The flow tube formations 40 comprise a bent rim 42 extending around each service opening 24 provided in section 18. As seen in FIGURE 3, each tube formation 40 extends substantially transversely away from the main or major surface 22 of gasket section 18. The projection 42 is formed as an integral part of gasket section 18.

Returning to FIGURE 1, gasket section 18 further defines one or more bendable closing tabs 43 provided on an outwardly extending edge thereof. Preferably, the bendable tabs 43 are integrally formed with the gasket section from which they protrude but such tabs could comprise separate elements. Moreover, it should be appreciated that bendable tabs 43 could alternatively or additionally be provided on an outwardly extending edge of gasket section 14. With either embodiment, the bendable tabs 43 laterally extend away from the gasket section to which they are attached a sufficient distance to allow them to be manipulated and/or bent around the other gasket layers to secure or retain all of the layered sections in a folded engaging relationship with each other.

In accordance with this invention, the gasket sections comprising the gasket body are interconnected to each other. The present invention contemplates interconnecting the gasket sections in any suitable manner allowing the gasket sections to be folded into an overlying and engaging relationship with one another.

To effect these ends, one or more bendable connections can be used to interconnect the gasket sections to each other. In the preferred embodiment, and as best seen in FIGURE 1, opposed peripheral edges on gasket sections 14, 16 and 18, respectively, are interconnected by a plurality of bendable bridges 48. As best illustrated in FIGURE 4, relatively small bridges 48 are formed in a zone of adjacency between gasket sections 14 and 16.

During the stamping or punching process, multiple gasket sections, integrally formed, are provided in an adjacent side-by-side manner from a single metal sheet. As is conventional, the die assemblies for punching the gasket sections are designed to configure the gasket sections to correspond to the particular application with which they find use. Moreover, the die assemblies can be designed to provide the bridges 48 between adjacent areas of the gasket sections. In the preferred embodiment, the bridges 48 are formed as integral
extensions between gasket sections.

As best illustrated in FIGURES 5, 6 and 7, the bendable connections 48 between the gasket section allow one interconnected gasket section 14 to be layered or folded into an overlying engaging relationship with another interconnected gasket section 16. Because the gasket sections are interconnected, they are not separated from one another when folded upon each other. That is, the bendable bridges 48 provided at the peripheral edges of the gasket sections 14 and 16 allow gasket section 14 to be folded while maintaining integrity between gasket sections. As seen in FIGURE 6, when gasket sections 14 and 16 are folded upon each other, the respective service openings 24, the respective embossments 28 and 29, as well as the respective apertures 26 are all arranged in substantial alignment.

Moreover, the folding of one gasket section upon the other creates a fold line defined at the peripheral edge of the gasket sections after one gasket section is folded upon the other gasket section.

Thereafter, and as seen in FIGURES 8, 9 and 10, the other gasket section 18 can likewise be folded into an overlying engaging relationship with the other gasket sections 14, 16, preferably in an accordion-like fashion. As seen in FIGURE 10, when the third gasket section 18 is folded into an engaging relationship with the other gasket sections, the flow tubes 40, formed as an integral part of gasket 18, transversely extend through the service openings 24 in the other gasket sections 14 and 16. That is, when the multiple gasket pieces are folded upon each other, a distal end of projection 42 extends through all layers of the gasket.

Each gasket section may further include indicia 50 (FIGURE 8) which can be stamped or otherwise provided thereon. The indicia 50 are provided for indicating the desired overlying relationship order for the gasket sections. Associated notches 52 may be used to view the indicia when the gasket sections are folded.

As seen in FIGURE 11, after the gasket sections comprising the gasket are folded, as in an accordion-like fashion, one upon the other, the distal or free end of each bendable tab 43 is folded over from its extended position, indicated by dash lines in FIG. 11, to interface with gasket section 14. The folded tabs 43 maintain and retain the gasket sections in their overlying and engaging relationship relative one another during packing, storage and installation.

In accordance with this invention, a method of manufacture involves providing multiple interconnected gasket sections, with each gasket section defining at least one service opening and at least one relatively small aperture. A preferred method involves providing at least two interconnected gasket sections. An alternative method involves providing at least three interconnected gasket sections all of which are integrally formed of metal.

These multiple interconnected gasket sections are then folded upon each other. That is, a first of the gasket sections is folded into an overlying engaging relationship with a second of the gasket sections along a fold line defined at a peripheral edge of each gasket section after one gasket section is folded upon the other gasket section. When three interconnected gasket sections are provided, they are preferably folded in an accordion-like relationship relative to each other.

Having folded the gasket sections into an overlying engaging relationship relative one another, closing tabs 43 are manipulated to retain the gasket sections in either folded relationship relative to each other.

A preferred method of manufacture may further involve providing an embossment on at least one of the gasket sections. The embossment encircles the service opening defined by the gasket section. The embossing operation, if any, is performed on the gasket section before the gasket sections are folded upon each other.

In another preferred form of the invention as shown in FIG. 12, and to enhance sealing, the embossments 28', 29' defined by gasket sections 14', 16', respectively, are formed with the projecting portion of each embossment 28', 29' extending away from main or major surface 22' of each gasket section and the indentation, recess, or cavity of each embossment extending inwardly from main or major surface 20' of each gasket section. As such, and when gasket section 14' is folded into an overlying engaging relation with gasket section 16', the projections of each embossment will extend in opposite directions and a compressible space will be provided between oppositely directed, and confronting, indentations of each embossment.

Because each of the gasket sections comprising the unitized gasket are interconnected to each other, they cannot become separated from each other. Therefore, the gasket will always include a proper combination and sequence of only interconnected gasket sections. Furthermore, the gasket sections may be interconnected in a manner defining the order with which they are to be folded upon each other. As such, each gasket section will have a proper orientation relative another gasket section and relative to the unitized gasket assembly. In effect, the unitized contemplated multi-layered gasket assembly avoids the possibility of human error and inadvertent assemblage.

Claims
1. A unitized multi-layered gasket (10) comprising a gasket body (12) including at least two integrally formed gasket sections (14, 16), each said gasket section defining a circumscribing peripheral edge, with each gasket section defining a service opening (24) within its periphery and at least one relatively small aperture (26) within its periphery, with the peripheral edge of a first of said gasket sections (14) being connected to the adjacent peripheral edge of a second of said gasket sections (16) in a manner allowing said first gasket section (14) to be folded into an overlying engaging relationship with said second gasket section (16) with said respective apertures (26) and said respective service openings (24) being in alignment, said first and second gasket sections (14, 16) being generally coextensive when in said overlying engaging relationship.

10. A unitized multi-layered gasket comprising: a gasket body (12) defining at least three integrally formed gasket sections (14, 16, 18) having connecting bridges at adjacent peripheral edges of said sections, each of said sections defining a service opening (24) and a relatively small aperture (26), said gasket sections being connected in a manner allowing said gasket sections to be folded about said bridges into an overlying engaging relationship with each other in an accordion-like fashion with said apertures (26) being substantially aligned with each other.

11. The multi-layered gasket of Claim 10 wherein at least one (16) of said gasket sections (14, 16, 18) includes an encircling embossment (28, 29) arranged about said service opening (24) and another gasket section (18) includes a flow tube (40) extending from a service opening (24) in said other gasket section through the service openings (24) in the other gasket sections when the gasket sections (14, 16, 18) are folded upon each other.

12. The unitized multi-layered gasket of Claim 10 wherein said gasket body further defines one or more bendable closing tabs (43) extending from at least one (18) of said gasket sections (14, 16, 18) for retaining said gasket sections in an overlying relationship relative to each other.

13. A method of forming a unitized multi-layered gasket assembly comprising the steps of: providing at least two integrally formed gasket sections each defining a service opening and a relatively small aperture; and folding a first of said gasket sections into an overlying engaging relationship with a second of said gasket sections along a fold line defined at a peripheral edge of each gasket section after one gasket section is folded upon the other gasket section.

14. The method of forming a unitized multi-layered gasket according to Claim 13 including a further step of providing an encircling embossment about said service opening on at least one of said gasket sections before said gasket sections are folded upon each other.

15. A method of forming a unitized multi-layered gasket assembly comprising the steps of:
providing at least three integrally formed gasket sections each defining a service opening and a relatively small aperture; and folding a first of said gasket sections into an overlying engaging relationship with a second of said gasket sections along a fold line defined at a peripheral edge of each gasket section after one gasket section is folded upon the other gasket section.

16. The method of forming a unitized multi-layered gasket according to Claim 15 including a further step of folding said sections in an accordion-like relationship relative to each other.

17. The method of forming a unitized multi-layered gasket according to Claim 14, and wherein said gasket sections are integrally formed from metal.

18. The method of forming a unitized multi-layered gasket according to Claim 17 including a further step of folding said sections in an accordion-like relationship relative to each other.

19. The method of forming a unitized multi-layered gasket according to Claim 18 including further steps of providing bendable closing tabs on at least one of said sections, and closing said tabs to retain the gasket sections in said folded accordion-like relationship relative to each other.

Patentansprüche

1. Eine vereinheitlichte, mehrschichtige Dichtung (10) umfaßt einen Dichtungskörper (12), der mindestens zwei einheitlich geformte Dichtungsabschnitte (14, 16) umfaßt, wobei jeder Dichtungsabschnitt einen umlaufenden peripheren Rand aufweist, jeder Dichtungsabschnitt eine Versorgungsoffnung (24) innerhalb seines Umfangs und mindestens eine verhältnismäßig kleine Öffnung (26) innerhalb seines Umfanges aufweist, der umlaufende Rand eines ersten der Dichtungsabschnitte (14) mit dem benachbarten umlaufenden Rand eines zweiten der Dichtungsabschnitte (16) in einer Weise verbunden ist, die es erlaubt, den ersten Dichtungsabschnitt (14) in Übereinandergelagert, gegenseitiger Berührung auf den zweiten Dichtungsabschnitt (16) zu falten, wobei der zweite Dichtungsabschnitt (16) mit den entsprechenden Durchbrechungen (26) und den entsprechenden Versorgungsoffnungen (24) fluchten und die ersten und die zweiten Dichtungsab-

schnitte (14 und 16) im allgemeinen sich gleich weit erstrecken, wenn sie, sich berührend, aufeinanderliegen.

2. Vereinheitlichte, mehrschichtige Dichtung nach Anspruch 1, bei der mindestens einer der Dichtungsabschnitte (14, 16, 18) eine vorspringende Prägung (28) bildet, welche die Versorgungsoffnung (24) umgibt, die von dem Dichtungsabschnitt (14, 16) gebildet ist.

3. Vereinheitlichte, mehrschichtige Dichtung nach Anspruch 1, bei der der Dichtungskörper (12) aus Metall besteht.

4. Vereinheitlichte, mehrschichtige Dichtung nach Anspruch 1, umfassend einen dritten Dichtungsabschnitt (18) und biegbare metallische Mittel (48), die den dritten Dichtungsabschnitt (18) an dem Dichtungskörper (12) befestigen.

5. Vereinheitlichte, mehrschichtige Dichtung nach Anspruch 4, bei der mindestens zwei der Dichtungsabschnitte (14, 16) einheitlich aus Metall geformt sind.

6. Vereinheitlichte, mehrschichtige Dichtung nach Anspruch 4, bei der mindestens drei der Dichtungsabschnitte (14, 16, 18) einheitlich geformt sind.

7. Vereinheitlichte, mehrschichtige Dichtung nach Anspruch 4, bei der jeder Dichtungsabschnitt Kennzeichen (50) zur Kennzeichnung einer Reihenfolge der Schichtung für die Dichtungsabschnitte (14, 16, 18) umfaßt.

8. Vereinheitlichte, mehrschichtige Dichtung nach Anspruch 1, bei der die Dichtungsabschnitte (14, 16, 18) durch eine oder mehrere Brücken (48) befestigt sind, wobei jede Brücke eine integrale Verlängerung der Abschnitte bildet.

9. Mehrschichtige Dichtung nach Anspruch 1, bei der der Dichtungskörper (12) einen oder mehrere biegbare Verschlußflappen (43) umfaßt, die sich von mindestens einem (18) der Dichtungsabschnitte (14, 16, 18) erstrecken und die handhabbar sind, um solche Dichtungsabschnitte in beschichteter, sich berührender Beziehung zueinander zu halten.

10. Vereinheitlichte, mehrschichtige Dichtung, bestehend aus: einem Dichtungskörper (12), der mindestens drei einheitlich geformte Dichtungsabschnitte (14, 16, 18) mit Verbindungsbücken an benachbarten, umlaufenden Rändern der Ab-
schnitte umfaßt, wobei jeder der Abschnitte
eine Versorgungsöffnung (24) und eine verhält-
nismäßig kleine Durchbrechung (26) aufweist
und die Dichtungsabschnitte in einer Weise
verbunden sind, die es erlaubt, die Dichtungs-
abschnitte um die Brücken in sich berührender
gegenseitiger Schichtung akkordeonähnlich
aufeinanderzufalten, wobei die Durchbrechungen
(26) im wesentlichen miteinander fluchten.

11. Mehrschichtige Dichtung nach Anspruch 10,
beidein mindestens einer (16) der Dichtungsab-
schnitte (14, 16, 18) eine umlaufende Prägung
(28, 29) umfaßt, die um die Versorgungsöff-
nung (24) herum angeordnet ist und einen weite-
ren Dichtungsabschnitt (18) ein Strömungsrohr
(40) umfaßt, das sich von einer Versorgungs-
öffnung (24) in dem anderen Dichtungsab-
schnitt durch die Versorgungsöffnung (24) in
den anderen Dichtungsabschnitten erstreckt,
wie die Dichtungsabschnitte (14, 16, 18) auf-
einandergealtet sind.

12. Vereinheitlichte, mehrschichtige Dichtung nach
Anspruch 10, bei der der Dichtungskörper ei-
en oder mehrere biegbare Verschlußlappen
(43) aufweist, die sich von mindestens einem
(18) der Dichtungsabschnitte (14, 16, 18) zum
Festhalten der Dichtungsabschnitte in einer
aufeinanderliegenden, relativen Lage zueinan-
der erstrecken.

13. Verfahren zur Herstellung einer vereinheitlich-
ten, mehrschichtigen Dichtungsanordnung, be-
stehend aus den Schritten der:
Bereitstellung von mindestens zwei einheitlich
gestalteten Dichtungsabschnitten, von denen je-
der eine Versorgungsöffnung und eine verhält-
nismäßig kleine Durchbrechung aufweist; und
Faltung eines ersten der Dichtungsabschnitte
in einer sich überlagernden und berührenden
Beziehung zu einem zweiten der Dichtungsab-
schnitte entlang einer Faltrline, die an einem
umlaufenden Rand jedes Dichtungsabschnitts
gebildet ist, nachdem ein Dichtungsabschnitt
auf den anderen Dichtungsabschnitt gefaltet
ist.

14. Verfahren zur Herstellung einer vereinheitlich-
ten, mehrschichtigen Dichtung gemäß An-
spruch 13, umfassend einen weiteren Schritt
 der Anordnung einer umlaufenden Prägung um
die Versorgungsöffnung auf mindestens einem
der Dichtungsabschnitte, bevor die Dichtungs-
abschnitte aufeinandergealtet worden.

15. Verfahren zur Herstellung einer vereinheitlich-
ten, mehrschichtigen Dichtungsanordnung, be-
stehend aus den Schritten der:
Bereitstellung von mindestens drei einheitlich
gestalteten Dichtungsabschnitten, von denen je-
der eine Versorgungsöffnung und eine verhält-
nismäßig kleine Durchbrechung aufweist; und
Faltung eines ersten der Dichtungsabschnitte
in sich überlagernden und berührenden Bezie-
hung auf einen zweiten der Dichtungsabschnitt-
te entlang einer Faltrline, die an einem umlauf-
fenden Rand jedes Dichtungsabschnitts gebil-
det wird, nachdem ein Dichtungsabschnitt auf
den anderen Dichtungsabschnitt gefaltet ist.

16. Verfahren zum Herstellen einer vereinheitlich-
ten, mehrschichtigen Dichtung gemäß An-
spruch 15, umfassend einen weiteren Schritt
des Falts der Abschnitte in einer akkordeon-
ähnlichen Beziehung zueinander.

17. Verfahren zur Herstellung einer vereinheitlich-
ten, mehrschichtigen Dichtung nach Anspruch
14, bei der die Dichtungsabschnitte einheitlich
aus Metall geformt werden.

18. Verfahren zur Herstellung einer vereinheitlich-
ten, mehrschichtigen Dichtung nach Anspruch
17, umfassend einen weiteren Schritt des Fal-
tens der Abschnitte in einer akkordeonähnli-
chen Beziehung zueinander.

19. Verfahren zur Herstellung einer vereinheitlich-
ten, mehrschichtigen Dichtung nach Anspruch
18, umfassend die Schritte der Anordnung von
biegbaren Verschlußlappen an mindestens ei-
 nem der Abschnitte und das Verschließen der
Abschnitte, um die Dichtungsabschnitte in der
gefalteten, akkordeonähnlichen Beziehung zu-
einander zu halten.

Revendications

1. Joint unifié (10) multicouches, comportant un
corps (12) de joint comprenant au moins deux
parties (14,16) de joint venues de matière,
chacune des parties de joint définissant un
bord périphérique la délimitant, chaque partie
de joint définissant une ouverture de service
(24) située dans sa périphérie et au moins un
orifice (26) relativement petit situé dans sa
périphérie, le bord périphérique d’une premiè-
re (14) desdites parties de joint étant relié au
bord périphérique adjacent d’une deuxième
(16) desdites parties de joint de manière à
permettre à la première partie (14) de joint
d’être pliée en contact avec recouvrement sur
la deuxième partie (16) de joint, les orifices
(28) respectifs et les ouvertures de service (24)
respectives étant en alignement, les première
et deuxième parties (14,16) de joint étant, de manière générale, de même étendue lorsqu’elles sont en contact avec recouvrement.

2. Joint uniifié multicouches selon la revendication 1, dans lequel au moins une des parties (14,16,18) de joint définit un bossage faisant saillie et entourant l’ouverture de service (24) définie par ladite partie (14,16) de joint.

3. Joint uniifié multicouches selon la revendication 1, dans lequel le corps (12) de joint est métallique.

4. Joint uniifié multicouches selon la revendication 1, comprenant en outre une troisième partie (18) de joint et des moyens métalliques (48), pouvant être pliés, de fixation deladite troisième partie de joint sur le corps (12) de joint.

5. Joint uniifié multicouches selon la revendication 4, dans lequel au moins deux des parties (14,16) de joint sont venues de matière en métal.

6. Joint uniifié multicouches selon la revendication 4, dans lequel au moins trois parties (14,16,18) de joint sont formées en étant venues de matière.

7. Joint uniifié multicouches selon la revendication 4, dans lequel chaque partie de joint comporte un indice (50) pour indiquer un ordre de mise en recouvrement des parties (14,16,18) de joint.

8. Joint uniifié multicouches selon la revendication 1, dans lequel les parties (14,16,18) de joint sont reliées par un ou plusieurs ponts (48), chaque pont étant une extension, venue de matière, desdites parties.

9. Joint uniifié multicouches selon la revendication 1, dans lequel le corps (12) de joint comporte en outre une ou plusieurs pattes formant fermetures (43), pouvant être pliées, s’étendant à partir d’au moins une (18) desdites parties (14,16,18) de joint, et qui peuvent être actionnées pour retenir les parties de joint en contact mutuel avec recouvrement.

10. Joint uniifié multicouches comprenant: un corps (12) de joint définissant au moins trois parties (14,16,18) de joint venues de matière, ayant des ponts de liaison situés sur des bords périphériques adjacentes des parties, chacune desdites parties définissant une ouverture de service (24) et un orifice (26) relati-

vernement petit, les parties de joint étant reliées de manière à permettre aux parties de joint d’être pliées autour desdits ponts en étant mises en contact mutuel avec recouvrement en forme d’accordéon, les orifices (26) étant à peu près alignés les uns avec les autres.

11. Joint uniifié multicouches selon la revendication 10, dans lequel au moins une (16) desdites parties (14,16,18) de joint comporte un bossage entourant (28,29) agencé autour de ladite ouverture de service (24) et une autre partie (18) de joint comporte un tube d’écoulement (40) s’étendant à partir d’une ouverture de service (24) de ladite autre partie de joint à travers les ouvertures de service (24) des autres parties de joint lorsque les parties (14,16,18) de joint sont pliées les unes sur les autres.

12. Joint uniifié multicouches selon la revendication 10, dans lequel le corps de joint définit en outre une ou plusieurs pattes de fermeture (43) pouvant être pliées, s’étendant à partir d’au moins une (18) des parties (14,16,18) de joint pour retenir les parties de joint en contact mutuel avec recouvrement.

13. Procédé de réalisation d’un ensemble formant joint uniifié multicouches, comportant les étapes consistant à: réaliser au moins deux parties de joint formées en étant venues de matière, chacune définissant une ouverture de service et un orifice relativement petit, et plier une première desdites parties de joint en contact avec recouvrement sur une deuxième desdites parties de joint, le long d’une ligne de pliage définie sur le bord périphérique de chaque partie de joint après avoir plié une partie de joint sur l’autre partie de joint.

14. Procédé de réalisation d’un joint uniifié multicouches selon la revendication 13, comportant en outre une étape consistant à réaliser un bossage d’encerclement, autour de ladite ouverture de service, sur au moins une des parties de joint, avant de plier les parties de joint les unes sur les autres.

15. Procédé de réalisation d’un ensemble formant joint uniifié multicouches, comportant les étapes consistant à: réaliser au moins trois parties de joint formées en étant venues de matière, définissant chacune une ouverture de service et un orifice relativement petit, et plier une première desdites parties de joint en
contact avec recouvrement sur une deuxième desdites parties de joint, le long d’une ligne de pliage définie sur un bord périphérique de chaque partie de joint après avoir plié une partie de joint sur l’autre partie de joint.


17. Procédé de réalisation d’un joint unifié multi-couches selon la revendication 14, et dans lequel les parties de joint sont venues de matière en métal.

18. Procédé de réalisation d’un joint unifié multi-couches selon la revendication 17, comportant en outre une étape consistant à plier lesdites parties les unes par rapport aux autres, en forme d’accordéon.
