

(19)



Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number:

0 243 951
A1

(12)

EUROPEAN PATENT APPLICATION

(21) Application number: **87106248.5**(51) Int. Cl.4: **F01N 3/28**(22) Date of filing: **29.04.87**(30) Priority: **29.04.86 FI 861800**(43) Date of publication of application:
04.11.87 Bulletin 87/45(84) Designated Contracting States:
AT BE CH DE ES FR GB IT LI NL SE(71) Applicant: **KEMIRA OY**
Porkkalankatu 3
SF-00180 Helsinki(FI)(72) Inventor: **Kanniainen, Kauko**
Koulutie 5 H 5
SF - 41330 Vihtavuori(FI)
Inventor: **Loukeinen, Veikko**
Aholantie 32
SF - 41330 Vihtavuori(FI)(74) Representative: **Liska, Horst, Dr. et al**
Patentanwälte H. Weickmann, Dr. K. Fincke,
F.A. Weickmann, B. Huber, Dr. H. Liska, Dr. J.
Prechtel Möhlstrasse 22 Postfach 86 08 20
D-8000 München 86(DE)(54) **A method for encasing a catalytic unit used for the purification of exhaust gases.**

(57) The invention relates to a method for encasing a catalytic unit (1) used for purifying exhaust gases, in which method the unit is placed inside a tube (2) and the ends of the tube are shaped into cones (3), whereby the catalytic unit (1) is secured at its ends to the outer jacket, and thereafter end cones (4) are fastened to the ends of the tube.

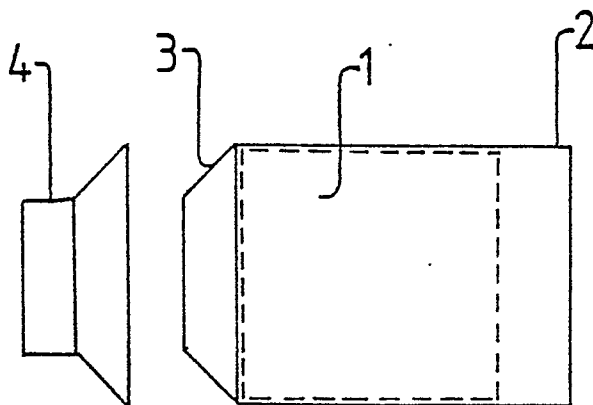


FIG. 1

EP 0 243 951 A1

A method for encasing a catalytic unit used for the purification of exhaust gases

The present invention relates to a method for encasing a catalytic unit used for the purification of exhaust gases, in which method the outer casing parts are fitted around at least one cell, whereafter the outer casing parts are secured together in order to form a jacket around the cell.

The catalytic units currently used are mainly ceramic, and therefore their encasing requires special precision and caution, owing to the brittleness of ceramic units. U.S. Patent 4,328,188 discloses an encasing method in which the jacket which constitutes the outer casing of the catalytic unit is made up of a pair of shells welded together along their edges. Longitudinal movement of the catalytic unit is prevented by forming in the shells a shoulder in which the unit fits and by securing the unit firmly by using separate retaining means welded to the casing. The separate retaining means may be a simple flange. It is necessary additionally to dispose between the jacket and the unit some resilient material, such as matting woven from steel wire or heat-resistant felt, so that the unit will not be damaged. Possible disadvantages due to thermal expansion are thereby also prevented.

U.S. Patent 4,400,860 discloses a method for encasing a metal unit, in which method the unit is placed between two casing halves which are pressed together and welded at the seam areas. The unit and the jacket are welded together by spot welding or by brazing.

In previously known methods it is necessary to use expensive press tools for preparing the casing halves, and if it is desired to change the size of the catalytic unit, new tools are always necessary, which results in high costs. In order to keep the costs at a moderate level, the known methods require large-scale manufacture in order to be profitable. However, since there are many makes and models of automobiles and since the same type of catalytic unit cannot be installed in all makes, the adjustability of the casing should be easy without incurring high costs of tooling.

It is the object of the present invention to provide a method for encasing catalytic units, without the disadvantages of previously known methods. This is achieved in accordance with the invention by fitting a catalytic unit, preferably of metal, inside a tube, preferably a metal tube, the beginning of which has selectively in advance been shaped into a cone, in which case the unit placed inside the tube is secured at its ends to the outer mantle, and thereafter suitable end cones are secured to the ends of the tube.

In the encasing method according to the invention, the two shells have been replaced by a tube and two end cones. The catalytic unit can be adjusted to fit different makes and models of automobiles simply by altering the length or the diameter of the tube and by changing the end cones, which is easy and inexpensive to do.

The tube used can be, for example, standard steel tube and the end cones can be made by using relatively inexpensive press tools. The cross-sectional configuration of the tube used as the jacket of the catalytic unit can vary from round to oval, and so the best possible alternative can be found for each automobile make. However, a tube of round cross-sectional configuration is usually the best and easiest structural solution. The method according to the invention for encasing a catalytic unit can thus be easily varied and is adaptable also to small-scale manufacture.

The catalytic units, made of metal, used in the method withstand without breaking the mechanical stresses possibly present during both the encasing stage and use. Thus no resilient material is needed between the jacket and the unit, as is required with ceramic units, and this decreases the size of the catalyst and reduces the costs of manufacture and material.

Longitudinal movement of the catalytic unit inside the casing can be prevented in a simple manner by the method according to the invention. The unit is placed in the tube, the beginning of which can selectively in advance be shaped as a cone, whereafter one or both ends of the tube are pressed into cone shape, whereby the unit pushed inside the tube is immobilized inside the jacket. Thereafter, suitable end cones are welded to the ends of the tube and the encased catalytic unit is ready.

According to one embodiment of the invention, one or two inward oriented grooves are formed in the metal tube, and two metal units are placed in the tube, one end of each catalytic unit being held in place by the groove/grooves formed in the tube.

It is, of course, also possible to place more than two catalytic units in a tube, in which case these units are retained at both ends by means of grooves formed in the tube.

The invention is illustrated below with reference to the accompanying drawings, in which

Figure 1 depicts the encasing method according to the invention, using one catalytic unit, and

Figure 2 depicts an embodiment of the invention, using two catalytic units.

Figure 1 shows a metal tube (2) having one end shaped into a cone (3). Inside the tube there is placed a catalytic unit (1). Thereafter the straight end of the tube is shaped into a cone and the end cones (4) are secured to the ends of the tube.

5

Figure 2 shows a metal tube (2) with two catalytic units (1) placed inside it. The cells are immobilized at the open ends of the tube by shaping the ends of the tube into cones (3), and the inner ends of the catalytic units are held in place by grooves (5) formed inward in the tube. In the last phase of the method, the end cones (4) are secured to the ends of the tube.

10

15

Claims

1. A method for encasing a catalytic unit used for purifying exhaust gases, in which method the casing parts are fitted around at least one catalytic unit, whereafter the casing parts are secured together in order to form a jacket around the unit, **characterized in** that a metal catalytic unit (1) is placed inside a tube (2), the beginning of the tube having selectively been shaped into a cone (3) in advance, and then the other or both ends of the tube are shaped into cones (3), whereby the catalytic unit fitted inside the tube is secured at its ends to the outer jacket, and thereafter suitable end cones (4) are secured to the ends of the tube, the end cones covering only the tube ends which have been shaped into cones.

20

25

30

2. A method according to Claim 1, **characterized in** that one or two inward oriented grooves (5) are formed in the tube (2), and two catalytic units (1) are placed in the tube, one end of each unit being retained by the groove/grooves (5) formed in the tube.

35

3. A method according to Claim 1 or 2, **characterized in** that the tube (2) is oval.

40

4. A method according to any of Claims 1-3, **characterized in** that the tube is of metal and that the metal end cones are secured by welding.

45

50

55

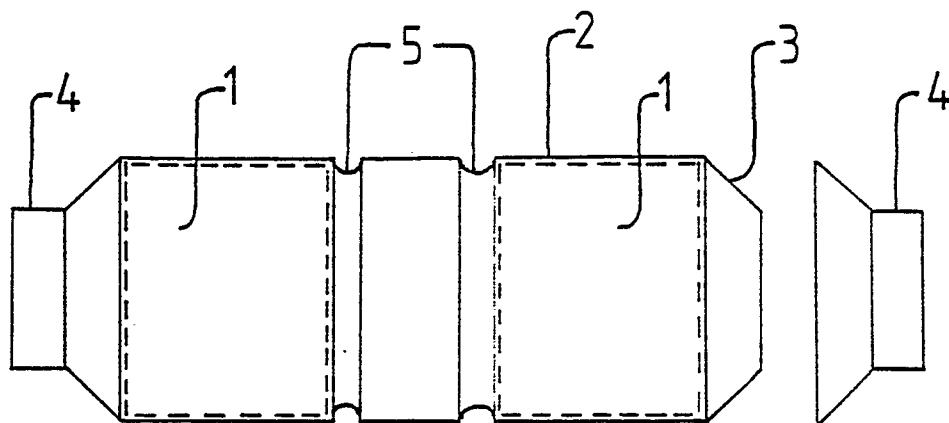


FIG. 2

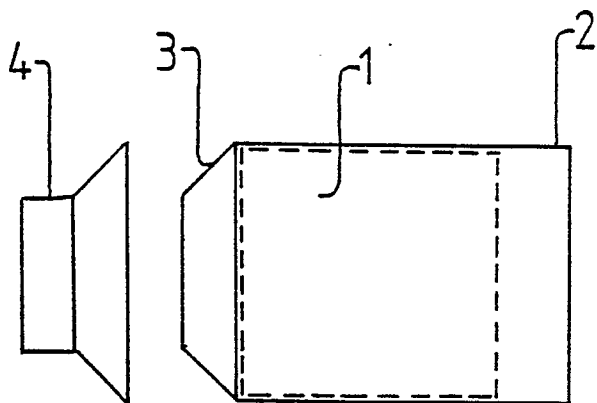


FIG. 1



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
A	GB-A-1 602 991 (BL CARS LTD) * Whole document *	1,4	F 01 N 3/28
A	DE-A-3 010 633 (VOLKSWAGENWERK) * Page 3, bottom - page 4, bottom; figures 1,2 *	1,2	
A	US-A-3 975 826 (BALLUFF) * Abstract; figure 1 *	1	
A	FR-A-2 179 257 (KALI-CHEMIE) * Page 3, middle - bottom; figure 1 *	1	
A	FR-A-2 214 041 (T.I. SILENCER SERVICES LTD) * Page 5, lines 10-30; figure 1 *	1	TECHNICAL FIELDS SEARCHED (Int. Cl.4)
A	DE-A-2 364 425 (BOYSEN) * Page 5, bottom - page 6, middle; figure 1 *	1	F 01 N
A	US-A-3 892 537 (GULATI)		
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 11-08-1987	Examiner FRIDEN C.M.
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	