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(54) **Vibration isolating insert for a pipe clip and method for manufacturing such an insert.**

(57) A vibration-isolating insert for a pipe clip is adapted to bear against an inner circumference of a substantially annular pipe clip body and ultimately - in use - to be positioned between the outer circumference of a pipe and the pipe clip body. The vibration-isolating insert comprises an elongate strip of vibration-isolating material which has a pipe facing side and a pipe clip facing side. The strip of vibration-isolating material has adjacent either lateral edge thereof a series of discrete exposed hooks of plastics material which is more rigid than the vibration-isolating material. The hooks protrude relative to the pipe clip facing side of the strip of vibration-isolating material.

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Title: Vibration isolating insert for a pipe clip and method for manufacturing such an insert.

The present invention relates to a vibration-isolating insert for a pipe clip, the vibration-isolating insert being adapted to bear against an inner circumference of a substantially annular pipe clip body and ultimately - in use - to be positioned between the outer circumference of a pipe and the pipe clip body, the vibration-isolating insert comprising an elongate strip of vibration-isolating material and having a pipe facing side and a pipe clip facing side.

A known problem with vibration-isolating inserts in pipe clips is that during installation of pipes, the pipe slides through the pipe clip which is not yet entirely tightened around the pipe. The friction between the pipe surface and the insert may cause the insert to be pulled out of the pipe clip body.

EP 413 883 A1 discloses a vibration-isolating insert formed as a profiled strip having substantially a U-shaped cross section. The profiled strip has a base strip made of a soft material and lateral wall portions that in use extend beyond the lateral edges of the pipe clip body. The respective lateral wall portions have an end portion bent inwardly to grip around respective lateral edges of the pipe clip body. The lateral wall portions are made of a harder material than the base strip so as to provide a better anchoring of the vibration-isolating insert in the pipe clip body. A disadvantage of this known vibration-isolating insert is that it has a high resistance to bending and it is difficult to adapt to the annular shape of the pipe clip, especially when pipe clips for smaller pipe diameters are to be assembled.

The present invention has for an object to provide a vibration isolating insert that overcomes or at least mitigates the mentioned disadvantage.

This object is achieved by a vibration-isolating insert for a pipe clip, the vibration-isolating insert being adapted to bear against an inner circumference of a substantially annular pipe clip body and ultimately - in use - to be positioned between the outer circumference of a pipe and the pipe clip body, the vibration-isolating insert comprising an elongate strip of vibration-isolating material which has a pipe facing side and a pipe clip facing side, said strip of vibration-isolating material having adjacent either lateral edge thereof a series of discrete exposed hooks of plastics material which is more rigid than the vibration-isolating material, the hooks protruding relative to the pipe clip facing side of the strip of vibration-isolating material.

The respective series of discrete hooks along the lateral edge portions provide retaining means that in use engage around respective edges of the pipe clip body. The bending resistance in longitudinal direction is determined by the continuous part of the

insert. Because the hooks are discrete items positioned at regular intervals, they have no or only a relatively small contribution to the bending resistance in the longitudinal direction of the insert. The bending resistance of the insert is thus mainly determined by the strip of vibration isolating insert, which is made from a “softer” material such as rubber or a thermoplastic elastomer.

In a possible embodiment two opposing hooks located on each of the lateral edge portions are interconnected by a connecting bridge of plastics material to form an integral hook unit. Preferably the integral hook unit is formed in one piece. The connecting bridge provides rigidity in the transverse direction between the two opposing hooks. Thereby the insert in the pipe clip is retained more secure in the pipe clip body.

In a possible embodiment said integral hook unit is interconnected with a previous and/or a subsequent integral hook unit by a flexible carrier strip, said carrier strip being attached to said strip of vibration-isolating material. Preferably the carrier strip is formed in one piece with the connecting bridges of said hook units.

The carrier strip is preferably substantially thinner than the connecting bridges. Thereby the low bending resistance of the vibration-isolating insert is warranted.

In a possible embodiment said connection bridge of said unit is, at least partly embedded in the vibration–isolating material of the strip. This results in that the hook unit is anchored firmly in the strip of vibration-isolating material.

In a particular embodiment the hook unit furthermore includes two legs connected with one end thereof to the bridge portion, preferably in a centre of the bridge portion, said legs each having at another end a pipe engagement protrusion, wherein the legs are embedded in the vibration-isolating material of the strip and the pipe engagement protrusions protrude outside the vibration-isolating material at the pipe facing side of the strip.

According to another aspect the invention relates to a vibration-isolating insert for a pipe clip, the vibration-isolating insert being adapted to bear against an inner circumference of a substantially annular pipe clip body and ultimately - in use - to be positioned between the outer circumference of a pipe and the pipe clip body, the vibration-isolating insert comprising an elongate strip of vibration-isolating material and having a pipe facing side and a pipe clip facing side, wherein the vibration-isolating insert has along each of the lateral edges at the pipe clip facing side a substantially L-shaped profile, the L-shaped profile having a first leg extending in alignment with the lateral side of the strip and a second leg extending from the first leg in a transverse direction, wherein the first leg is made of vibration isolating material and the second leg is made of a plastic material which is more rigid than the vibration-isolating material.

The insert according to this aspect has a lower bending resistance than the known vibration-isolating insert of EP 413 883 A1, while the retaining force is increased with regard to inserts which are entirely made of vibration isolating material.

The invention also relates to a pipe clip comprising an annular pipe clip body and a vibration-isolating insert as described in the above, wherein the vibration-isolating insert is arranged on the radially seen inner side of the pipe clip body.

The invention also relates to a method for manufacturing a vibration-isolating insert, the vibration-isolating insert being adapted to bear against an inner circumference of a substantially annular pipe clip body and ultimately - in use - to be positioned between the outer circumference of a pipe and the pipe clip body, said method including the following steps:

- coextruding a continuous strip of vibration-isolating material, and a continuous strip of plastics material which is more rigid than the vibration-isolating material, wherein the strip of plastics material has a profiled section with hooks formed at the lateral sides,
- removing a transverse section of the strip of plastics material at constant intervals.

The transverse section of the strip of plastics material may advantageously be removed by punching. Another option is to remove the transverse section of the strip of plastics material by milling.

The transverse section of the strip of plastics material may be removed entirely. Another option is that the transverse section is removed to such an extent that a film layer of said plastic material remains. The latter has the advantage that the integrity of the vibration isolating strip can be warranted. Furthermore a better attachment of the vibration-isolating strip and the plastic parts can be expected.

The invention also relates to a method for manufacturing a vibration-isolating insert, the vibration-isolating insert being adapted to bear against an inner circumference of a substantially annular pipe clip body and ultimately - in use - to be positioned between the outer circumference of a pipe and the pipe clip body, said method including the following steps:

- extruding a continuous strip of plastics material, wherein the strip of plastics material has a profiled section with hooks formed at the lateral sides,
- removing a transverse section of the strip of plastics material at constant intervals to such an extent that a film layer of said plastic material remains whereby a carrier strip with hook units at constant intervals is formed,
- feed the carrier strip to an extrusion device and extrude a strip of vibration-isolating material to a back of the carrier strip, wherein the vibration-isolating material is less rigid than the plastics material.

In this method the plastic part and the part made of vibration-isolating material, such as rubber or another elastomer, can be formed separately in separate moulds and then be brought together and fused or adhered to one another.

The invention also relates to a method for manufacturing a vibration-isolating insert, the vibration-isolating insert being adapted to bear against an inner circumference of a substantially annular pipe clip body and ultimately - in use - to be positioned between the outer circumference of a pipe and the pipe clip body, said method including the following steps:

- forming hook units of plastics material, said hook units comprising two opposing hooks interconnected by a connecting bridge,
- providing a mould for moulding a strip of vibration-isolating material,
- positioning a plurality of said hook units in said mould at regular intervals,
- injecting vibration-isolating material in the mould whereby the connecting bridge of said hook units is at least partially embedded in the vibration-isolating material.

According to this method the vibration-isolating insert is made by so called “insert moulding”, wherein the hook units are the inserts and the vibration-isolating material is injected around the inserts in the mould.

In a possible embodiment of the method the hook units are formed by injection moulding them of a plastics material. Another option is to form the hook units by punching them out of a sheet. It is conceivable to punch the hook units from another suitable material than plastic, e.g. metal, a composite or a paper based sheet.

The invention will be described in more detail in the following description with reference to the drawing, in which:

Fig. 1 shows a view in perspective of a possible embodiment of a vibration-isolating insert according to the invention,

Fig. 2 shows a view in perspective of a pipe clip including the insert of Fig. 1 arranged around a pipe,

Fig. 3 shows a view in perspective of another embodiment of a vibration-isolating insert according to the invention,

Fig. 4 shows a view in perspective of yet another vibration-isolating insert in a straight strip form,

Fig. 5 shows a view in perspective of yet another vibration-isolating insert according to the invention,

Fig. 6 shows an insert used in the manufacturing of the insert of Fig. 5, and

Fig. 7 shows a view in perspective of another vibration-isolating insert.

In Fig. 1 is illustrated the general idea of a vibration-isolating insert with hooks. Fig. 1 shows a vibration isolating insert 1 in a bent fashion. The vibration-isolating insert 1 is fitted in the bent fashion in a pipe clip body, but is produced in a straight fashion. The insert 1 comprises an elongate strip 2 of vibration-isolating material. The strip 2 has a pipe facing side 3 and a pipe clip facing side 4. In the embodiment of Fig. 1 the pipe facing side 3 of the vibration isolating strip 2 is provided with longitudinal ribs 6 and 7.

Adjacent either lateral edge of the strip 2 a series of discrete exposed hooks 5a and 5b respectively of plastics material are arranged. “Discrete” means here that the hooks in the series are positioned more or less independent from each other. The interconnection of the hooks in a series is provided by the strip 2 of vibration isolating material to which they are attached and in some embodiments a thin plastic film as will be described below in relation to Fig. 4. “Exposed” means that the plastic hooks are not covered by or embedded in the vibration- isolating material.

The hooks 5a and 5b are protruding relative to the pipe clip facing side 4 of the strip 2 of vibration-isolating material. The plastic material of the hooks 5a, 5b is more rigid than the vibration-isolating material of the strip 2.

The vibration-isolating insert 1 is arranged in a pipe clip body 26 of a pipe clip 20 as is shown in Fig. 2. Such a pipe clip body 26 has a substantially annular shape and is preferably made of metal. The pipe clip body 26 has end flanges 22 and 23, which define a clip opening such that the clip body can be opened to arrange it around a pipe 100. The end flanges 22, 23 are tightened together by tightening means. The tightening means include a male fastening element 24, e.g. a screw and a female fastening element 25, e.g. a nut, which in use cooperate to tighten the flanges 22 and 23 together and tighten the pipe clip around the pipe 100.

In use the pipe clip facing side 4 of the strip 2 bears against an inner circumference of the pipe clip body 26. In use the insert 1 is positioned between the outer circumference of a pipe 100 and the pipe clip body 26. The hooks 5a, 5b grip around the lateral edges 21 of the pipe clip body 26.

The outer longitudinal ribs 6 of the vibration-isolating strip 2 are provided with a tip portion 13 that is made of a material of greater hardness than the vibration-isolating material of the strip 2. Thereby the friction between the pipe surface and the tip portion 13 of the ribs 6 is reduced. During installation of a pipe 100 in the pipe clip 20, the pipe clip is not yet fully tensioned and the pipe can slide with respect to the pipe clip 20 to put it in the desired position. The outer ribs 6 are preferably higher than the inner ribs 7, whereby the pipe surface will contact the tip portions 13 of the outer ribs. This makes movement between pipe and pipe clip insert 1 easier and reduces the risk of distortion of the insert 1, and even removal of the insert 1 from the pipe clip 20. When the pipe clip 20 is tightened around the

pipe, the other ribs 7 and the further parts of the pipe facing side 3 come into engagement with the pipe surface.

In Fig. 3 an advantageous embodiment of a vibration-isolating insert according to the invention is shown. The general structure is the same as in Fig. 1 and the same features are thus indicated by the same reference numerals.

In the embodiment of Fig. 3 two opposing hooks 5a and 5b located at each of the lateral edges are interconnected by a connecting bridge 8 of plastics material to form an integral hook unit 9. The connection bridge 8 of said unit 9 is, at least partly embedded in the vibration–isolating material of the strip 2.

The hook units 9 can be formed of plastics material by a suitable method. The hook units can for example be formed by injection moulding. Alternatively the hook units may be punched out of a plastic sheet. Another possibility is to form a profiled section by a continuous process such as extrusion, and then cut of hook units 9 from the profiled section.

In a possible embodiment of the method a number of hook units 9 is positioned in a mould for moulding a strip of vibration-isolating material. The hook units 9 are positioned in the mould at regular intervals. Then vibration-isolating material is injected in the mould to form a strip 2 of vibration-isolating material whereby the connecting bridge 8 of said hook units 9 is at least partially embedded in the vibration-isolating material.

In Fig. 4 a further embodiment of a vibration-isolating insert is shown. In this figure the same features are indicated with the same reference numerals as in embodiments of Figs 1-3 and for a description of these features is referred to the above.

The embodiment of the vibration-isolating insert of Fig. 4 is shown in a straight fashion. Evidently it can be bent to fit it in a pipe clip body as is illustrated in Fig. 2.

The embodiment of Fig. 4 has hook units 9 each comprising a hook 5a and 5b interconnected by a connecting bridge 8. The consecutive hook units 9, that, seen in the longitudinal direction of the insert, are located at a mutual distance to each other, are interconnected by a carrier strip 10. The carrier strip 10 is in a preferred embodiment a plastic film which is formed in one piece with the hook units.

The integral carrier strip 10 with the hook units 9 can be formed by extruding a continuous strip of plastics material, wherein the strip of plastics material has a profiled section with hooks formed at the lateral sides. Next a transverse section of the strip of plastics material is removed at constant intervals to such an extent that a film layer of said plastic material remains. Thereby a carrier strip 10 with hook units 9 at constant intervals is formed.

The transverse section of the strip of plastics material may be removed by punching, or by milling.

The transverse section is removed to such an extent that a film layer of said plastic material remains.

The carrier strip 10 with the integral hook units 9 can be fed to an extrusion device. In the extrusion device a strip of vibration-isolating material, that is less rigid than the plastics material, is extruded to a back of the carrier strip 10, i.e. the side opposite the side where the hook units 9 are formed.

Alternatively a continuous strip of vibration-isolating material, and a continuous strip of plastics material which is more rigid than the vibration-isolating material are coextruded, wherein the strip of plastics material has a profiled section with hooks formed at the lateral sides. After the coextruded strip is cooled sufficiently a transverse section of the strip of plastics material at constant intervals is removed, thereby forming the hook units.

In this latter method it is possible to remove the transverse section to such an extent that a film layer of said plastic material remains, but it is also possible to remove the entire transverse section. In the latter case the hook units 9 are not connected by a plastic film.

It is also conceivable that a carrier strip 10 with integral hook units 9 and a strip 2 of vibration-isolating material are formed separately and are then joined by a suitable joining method, e.g. by means of an adhesive, or fusing the materials by heating them and then joining them.

It is also conceivable that the carrier strip 10 with integral hook units 9 is not made in one piece but is assembled from hook units 9 and a carrier strip from suitable carrier material, which may be different from the plastic material from the hook units 9. As a carrier material could for example be used a woven material, e.g. a woven fabric.

In Fig. 5 is shown another embodiment of a vibration-isolating insert. The same features are indicated with the same reference numerals as in the above described embodiments.

The vibration isolating insert of Fig 5 has hook units 9 two opposing hooks 5a, 5b interconnected by a connecting bridge 8. The hook unit 9 is shown in Fig. 6. The connecting bridge 8 is embedded in the vibration–isolating material of the strip 2.

This embodiment can be manufactured by providing a mould for moulding a strip of vibration-isolating material, and positioning a plurality of said hook units in said mould at regular intervals. Then vibration-isolating material is injected in the mould whereby the connecting bridge 8 of said hook units 9 is at least partially embedded in the vibration-isolating material.

The hook units 9 can be formed by injection moulding them of a plastics material. An alternative is to form the hook units 9 by punching them out of a sheet of a suitable material, in particular plastic, although also other materials are conceivable, such as composites or metal.

The hook unit 9 in Fig. 6 has an additional feature compared to other hook units described in the above, which is that it furthermore includes two legs 11 connected with one end thereof to the bridge portion 8, preferably in a centre of the bridge portion 8. The legs 11 each have at another end a pipe engagement protrusion 12. The legs 11 are embedded in the vibration-isolating material of the strip as becomes clear from Fig. 5. The pipe engagement protrusions 12 protrude outside the vibration-isolating material at the pipe facing side 3 of the strip 2 as can be seen in Fig. 5.

The pipe engagement protrusions 12 have the same function as the longitudinal ribs on the inner side of the strip 2 in Figs 1 and 2. Because the material of the protrusions 12 is harder than the vibration-isolating material, the friction between a pipe surface and the insert is reduced. Thereby the pipe can during installation slide easier through the insert.

In Fig. 7 is shown another vibration isolating insert 71 for a pipe clip. The vibration-isolating insert 71 comprises an elongate strip 72 of vibration-isolating material and has a pipe facing side 73 and a pipe clip facing side 74. The vibration-isolating insert 72 has along each of the lateral edges at the pipe clip facing side a substantially L-shaped profile 75. The L-shaped profile has a first leg 76 extending in alignment with the lateral side 77 of the strip 72 and a second leg 78 extending from the first leg 76 in a transverse direction. The first leg 76 is made of vibration isolating material and the second leg 78 is made of a plastic material which is more rigid than the vibration-isolating material.

CONCLUSIES

1. Trillingsisolerende inlage voor een pijpbeugel, welke trillingsisolerende inlage is ingericht om tegen een binnenomtrek van een in hoofdzaak ringvormig pijpbeugellichaam aan te liggen en uiteindelijk – in gebruik – te worden gepositioneerd tussen de buitenomtrek van een pijp en het pijpbeugellichaam, waarbij de trillingsisolerende inlage een langwerpige strook van trillingsisolerend materiaal omvat die een naar de pijp gekeerde zijde en een naar de pijpbeugel gekeerde zijde heeft, welke strook van trillingsisolerend materiaal aangrenzend aan elke dwarsrand ervan een serie van discrete onbedekte haken heeft van kunststofmateriaal dat stijver is dan het trillingsisolerende materiaal, waarbij de haken uitsteken ten opzichte van de naar de pijpbeugel gekeerde zijde van de strook van trillingsisolerend materiaal.

2. Trillingsisolerende inlage volgens conclusie 1, waarbij twee tegenovergestelde haken die zich aan elk van de dwarsranden bevinden onderling zijn verbonden door een verbindingsbrug van kunststofmateriaal om een integrale haakeenheid te vormen.

3. Trillingsisolerende inlage volgens conclusie 2, waarbij de integrale haakeenheid in één stuk is gevormd.

4. Trillingsisolerende inlage volgens conclusie 2 of 3, waarbij de integrale haakeenheid is verbonden met een vorige en/of een volgende integrale haakeenheid door een flexibele draagstrook, welke draagstrook is bevestigd aan de strook van trillingsisolerend materiaal.

5. Trillingsisolerende inlage volgens conclusie 4, waarbij de draagstrook in één stuk is gevormd met de verbindingsbruggen van de haakeenheden.

6. Trillingsisolerende inlage volgens conclusie 7, waarbij de draagstrook aanzienlijk dunner is dan de verbindingsbruggen.

7. Trillingsisolerende inlage volgens conclusie 2 of 3, waarbij de verbindingsbrug van de eenheid, althans gedeeltelijk, is ingebed in het trillingsisolerende materiaal van de strook.

8. Trillingsisolerende inlage volgens conclusie 7, waarbij de haakeenheid verder twee benen omvat die met een einde ervan met het bruggedeelte zijn verbonden, bij voorkeur in een midden van het bruggedeelte, waarbij de benen elk aan een ander einde een pijp-aangrijpingsuitsteeksel hebben, waarbij de benen zijn ingebed in het trillingsisolerende materiaal van de strook en de pijpaangrijpingsuitsteeksels aan de naar de pijp gekeerde zijde van de strook buiten het trillingsisolerende materiaal uitsteken.

9. Trillingsisolerende inlage voor een pijpbeugel, waarbij de trillingsisolerende inlage is ingericht om tegen een binnenomtrek van een in hoofdzaak ringvormig pijpbeugellichaam aan te liggen en uiteindelijk – in gebruik – te worden gepositioneerd tussen de buitenomtrek van een pijp en het pijpbeugellichaam, waarbij de trillingsisolerende inlage een langwerpige strook van trillingsisolerend materiaal omvat en een naar de pijp gekeerde zijde en een naar de pijpbeugel gekeerde zijde heeft, waarbij de trillingsisolerende inlage langs elk van de zijranden aan de naar de pijpbeugel gekeerde zijde een in hoofdzaak L-vormig profiel heeft, welk L-vormig profiel een eerste been heeft dat zich in lijn met de zijkant van de strook uitstrekt en een tweede been dat zich vanaf het eerste been in een dwarsrichting uitstrekt, waarbij het eerste been is gemaakt van trillingsisolerend materiaal en het tweede been is gemaakt van een kunststofmateriaal dat stijver is dan het trillingsisolerende materiaal.

10. Pijpbeugel omvattende een ringvormig pijpbeugellichaam en een trillingsisolerende inlage volgens een van de voorgaande conclusies, waarbij de trillingsisolerende inlage aan de radiaal gezien binnenzijde van het pijpbeugellichaam is aangebracht.

11. Werkwijze voor het vervaardigen van een trillingsisolerende inlage, welke trillingsisolerende inlage is ingericht om tegen een binnenomtrek van een in hoofdzaak ringvormig pijpbeugellichaam aan te liggen en uiteindelijk – in gebruik – te worden gepositioneerd tussen de buitenomtrek van een pijp en het pijpbeugellichaam, welke werkwijze de volgende stappen omvat:

- het coëxtruderen van een continue strook van trillingsisolerend materiaal, en een continue strook van kunststofmateriaal dat stijver is dan het trillingsisolerende materiaal, waarbij de strook van kunststofmateriaal een geprofileerde doorsnede heeft met haken gevormd aan de zijkanten,
- het verwijderen van een dwarsgedeelte van de strook van kunststofmateriaal op constante intervallen.

12. Werkwijze volgens conclusie 11, waarbij het dwarsgedeelte van de strook van kunststofmateriaal wordt verwijderd door stansen.

13. Werkwijze volgens conclusie 11, waarbij het dwarsgedeelte van de strook van kunststofmateriaal wordt verwijderd door frezen.

14. Werkwijze volgens een van de conclusies 11-13, waarbij het dwarsgedeelte in zijn geheel wordt verwijderd.

15. Werkwijze volgens een van de conclusies 11-13, waarbij het dwarsgedeelte wordt verwijderd in een zodanige mate dat een filmlaag van het kunststofmateriaal overblijft.

16. Werkwijze voor het vervaardigen van een trillingsisolerende inlaag, welke trillingsisolerende inlaag is ingericht om tegen een binnenomtrek van een in hoofdzaak ringvormig pijpbeugellichaam aan te liggen en uiteindelijk – in gebruik – te worden gepositioneerd tussen de buitenomtrek van een pijp en het pijpbeugellichaam, welke werkwijze de volgende stappen omvat:

- het extruderen van een continue strook van kunststofmateriaal, waarbij de strook van kunststofmateriaal een geprofileerde doorsnede met haken gevormd aan de zijkanten heeft,
- het verwijderen van een dwarsgedeelte van de strook van kunststofmateriaal op constante intervallen in zodanige mate dat een filmlaag van het kunststofmateriaal overblijft, waardoor een dragerstrook met haakeenheden op constante intervallen wordt gevormd,
- het toevoeren van de dragerstrook aan een extrusie-inrichting en het extruderen van een strook van trillingsisolerend materiaal op een rug van de dragerstrook, waarbij het trillingsisolerende materiaal minder stijf is dan het kunststofmateriaal.

17. Werkwijze voor het vervaardigen van een trillingsisolerende inlage, welke trillingsisolerende inlage is ingericht om tegen een binnenomtrek van een in hoofdzaak ringvormig pijpbeugellichaam aan te liggen en uiteindelijk – in gebruik – te worden gepositioneerd tussen de buitenomtrek van een pijp en het pijpbeugellichaam, welke werkwijze de volgende stappen omvat:

- het vormen van haakeenheden van kunststofmateriaal, welke haakeenheden twee tegenovergestelde haken omvatten die onderling zijn verbonden door een verbindingsbrug,
- het verschaffen van een matrijs voor het vormen van een strook van trillingsisolerend materiaal,
- het positioneren van meerdere haakeenheden in de matrijs op regelmatige intervallen,
- het injecteren van trillingsisolerend materiaal in de matrijs waardoor de verbindingsbrug van de haakeenheden ten minste gedeeltelijk wordt ingebed in het trillingsisolerende materiaal.

18. Werkwijze volgens conclusie 17, waarbij de haakeenheden gevormd worden door de haken uit kunststofmateriaal te spuitgieten.

19. Werkwijze volgens conclusie 17, waarbij de haakeenheden worden gevormd door ze uit een vel te stansen.

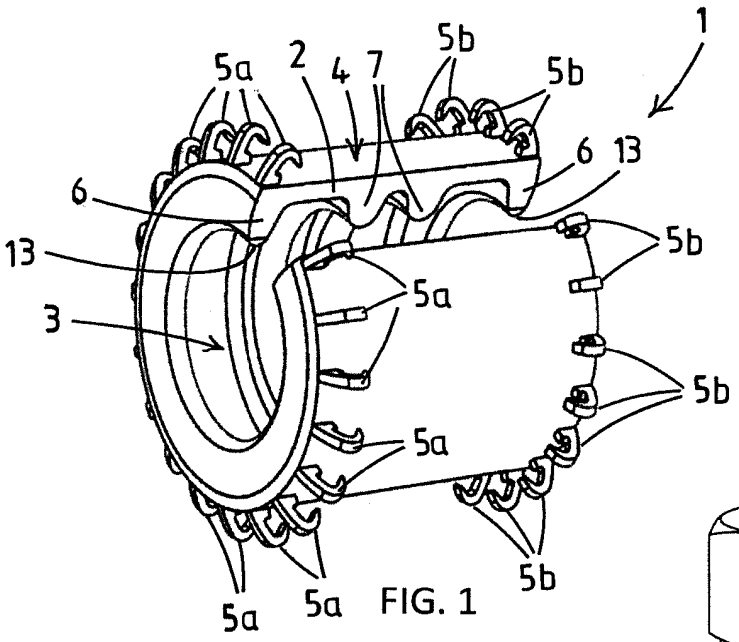

FIG. 1

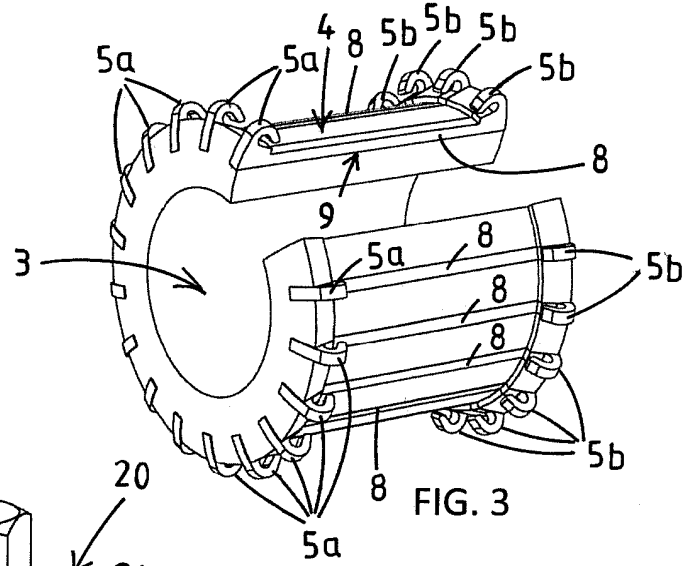

FIG. 3

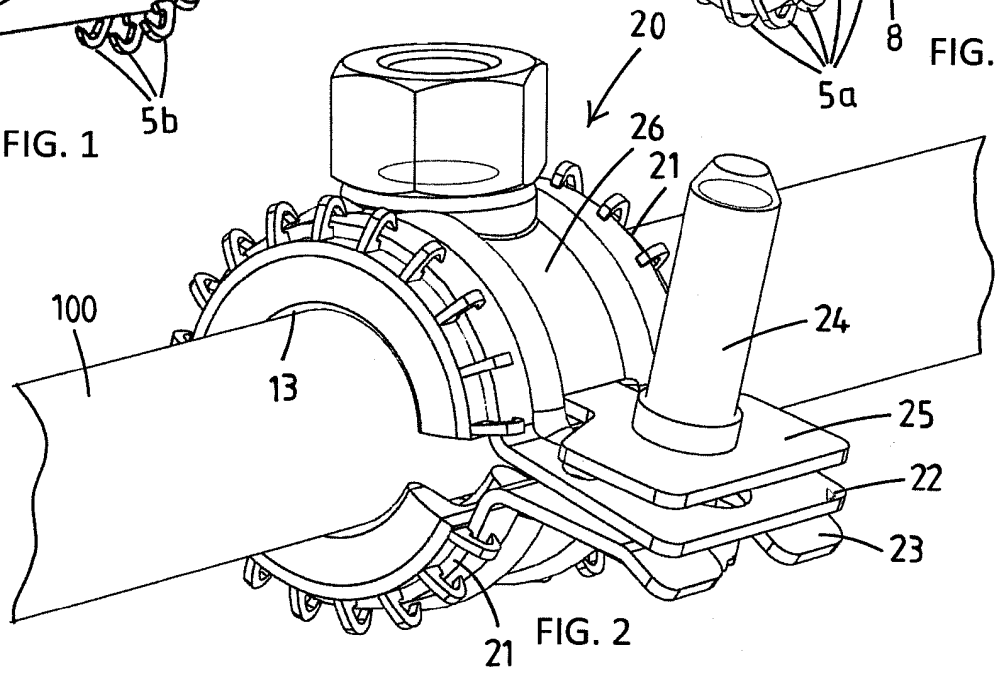

FIG. 2

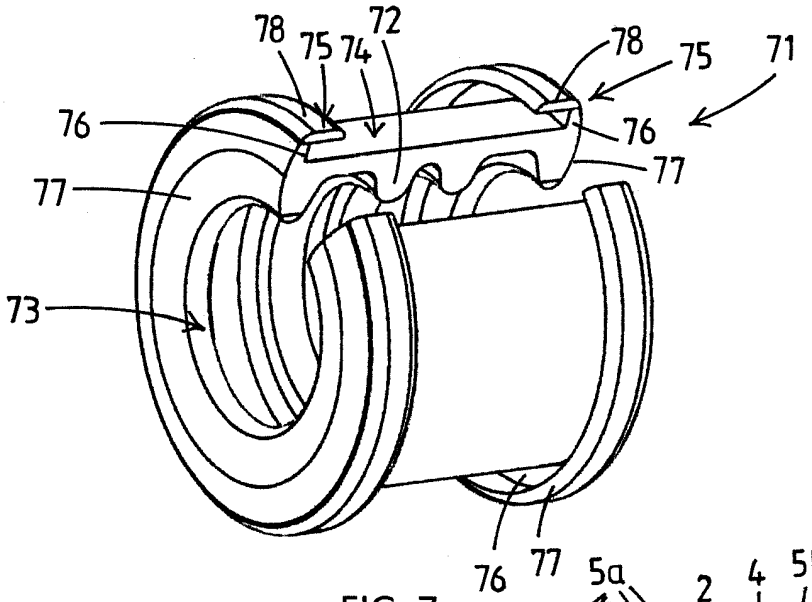

FIG. 7

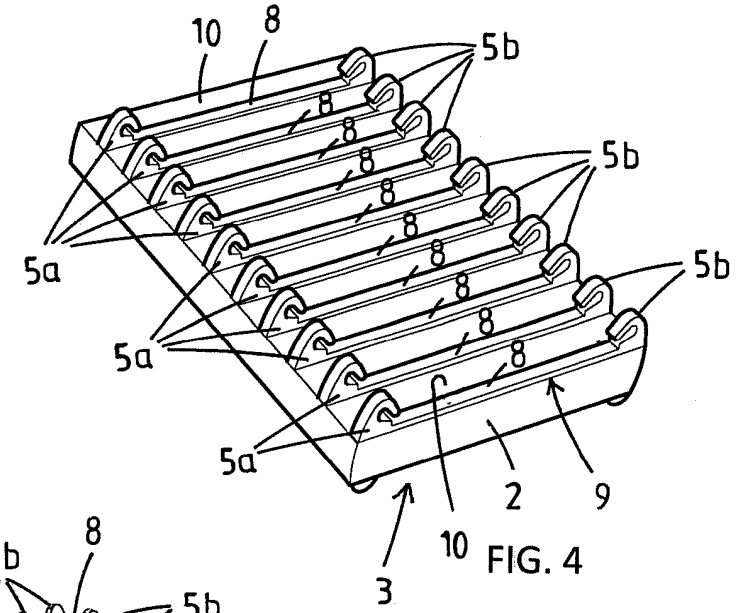

FIG. 4

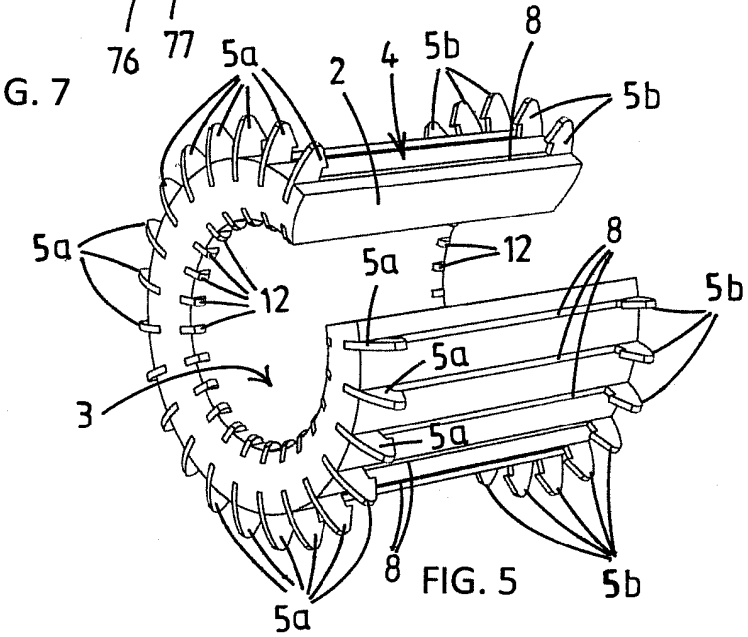

FIG. 5

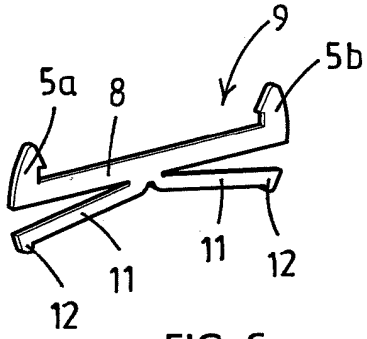

FIG. 6

ABSTRACT

A vibration-isolating insert for a pipe clip is adapted to bear against an inner circumference of a substantially annular pipe clip body and ultimately - in use - to be positioned between the outer circumference of a pipe and the pipe clip body. The vibration-isolating insert comprises an elongate strip of vibration-isolating material which has a pipe facing side and a pipe clip facing side. The strip of vibration-isolating material has adjacent either lateral edge thereof a series of discrete exposed hooks of plastics material which is more rigid than the vibration-isolating material. The hooks protrude relative to the pipe clip facing side of the strip of vibration-isolating material.

SAMENWERKINGSVERDRAG (PCT)

RAPPORT BETREFFENDE NIEUWHEIDSONDERZOEK VAN INTERNATIONAAL TYPE

IDENTIFICATIE VAN DE NATIONALE AANVRAGE	KENMERK VAN DE AANVRAGER OF VAN DE GEMACHTIGDE
	P32077NL00/CHO
Nederlands aanvraag nr. 2013596	Indieningsdatum 08-10-2014
	Ingeroepen voorrangsdatum
Aanvrager (Naam) J. van Walraven Holding B.V.	
Datum van het verzoek voor een onderzoek van internationaal type 10-01-2015	Door de Instantie voor Internationaal Onderzoek aan het verzoek voor een onderzoek van internationaal type toegekend nr. SN63233

I. CLASSIFICATIE VAN HET ONDERWERP (bij toepassing van verschillende classificaties, alle classificatiesymbolen opgeven)

Volgens de internationale classificatie (IPC)

F16L55/035;F16L3/08

II. ONDERZOCHTE GEBIEDEN VAN DE TECHNIEK

Onderzochte minimumdocumentatie

Classificatiesysteem	Classificatiesymbolen
IPC	F16L

Onderzochte andere documentatie dan de minimum documentatie, voor zover dergelijke documenten in de onderzochte gebieden zijn opgenomen

III. [ ] GEEN ONDERZOEK MOGELIJK VOOR BEPAALDE CONCLUSIES (opmerkingen op aanvullingsblad)

IV. [X] GEBREK AAN EENHEID VAN UITVINDING (opmerkingen op aanvullingsblad)

ONDERZOEKSRAPPORT BETREFFENDE HET RESULTAAT VAN HET ONDERZOEK NAAR DE STAND VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE

Nummer van het verzoek om een onderzoek naar de stand van de techniek
NL 2013596

A. CLASSIFICATIE VAN HET ONDERWERP
INV. F16L55/035 F16L3/08
ADD.

Volgens de Internationale Classificatie van octrooien (IPC) of zowel volgens de nationale classificatie als volgens de IPC.

B. ONDERZOCHTE GEBIEDEN VAN DE TECHNIEK

Onderzochte miminum documentatie (classificatie gevolgd door classificatiesymbolen)
F16L

Onderzochte andere documentatie dan de mimimum documentatie, voor dergelijke documenten, voor zover dergelijke documenten in de onderzochte gebieden zijn opgenomen

Tijdens het onderzoek geraadpleegde elektronische gegevensbestanden (naam van de gegevensbestanden en, waar uitvoerbaar, gebruikte trefwoorden)
EPO-Internal, WPI Data

C. VAN BELANG GEACHTE DOCUMENTEN

Categorie °	Geciteerde documenten, eventueel met aanduiding van speciaal van belang zijnde passages	Van belang voor conclusie nr.
	EENHEID VAN UITVINDING ONTBREEKT zie aanvullingsblad B -----	
X	DE 10 2007 052701 A1 (FISCHERWERKE GMBH & CO KG [DE]) 7 mei 2009 (2009-05-07) * alineas [0017] - [0031]; figuur 4 * -----	9
A	EP 2 133 617 A1 (WALRAVEN HOLDING BV J VAN [NL]) 16 december 2009 (2009-12-16) * kolommen 31-64; figuren 5-8 * -----	1-8,10
A,D	EP 0 413 883 A1 (POPPE & CO GIESSENER GUMMIWARE [DE]) 27 februari 1991 (1991-02-27) in de aanvraag genoemd * het gehele document * -----	1-10

☐ Verdere documenten worden vermeld in het vervolg van vak C.

☒ Leden van dezelfde octrooifamilie zijn vermeld in een bijlage

° Speciale categorieën van aangehaalde documenten

"A" niet tot de categorie X of Y behorende literatuur die de stand van de techniek beschrijft

"D" in de octrooiaanvrage vermeld

"E" eerdere octrooi(aanvrage), gepubliceerd op of na de indieningsdatum, waarin dezelfde uitvinding wordt beschreven

"L" om andere redenen vermelde literatuur

"O" niet-schriftelijke stand van de techniek

"P" tussen de voorrangsdatum en de indieningsdatum gepubliceerde literatuur

"T" na de indieningsdatum of de voorrangsdatum gepubliceerde literatuur die niet bezwarend is voor de octrooiaanvrage, maar wordt vermeld ter verheldering van de theorie of het principe dat ten grondslag ligt aan de uitvinding

"X" de conclusie wordt als niet nieuw of niet inventief beschouwd ten opzichte van deze literatuur

"Y" de conclusie wordt als niet inventief beschouwd ten opzichte van de combinatie van deze literatuur met andere geciteerde literatuur van dezelfde categorie, waarbij de combinatie voor de vakman voor de hand liggend wordt geacht

"&" lid van dezelfde octrooifamilie of overeenkomstige octrooipublicatie

Datum waarop het onderzoek naar de stand van de techniek van internationaal type werd voltooid	Verzenddatum van het rapport van het onderzoek naar de stand van de techniek van internationaal type
29 januari 2015	

Naam en adres van de instantie	De bevoegde ambtenaar
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Fromentel, Henri

Formulier PCT/ISA/201 (tweede blad) (Januari 2004)

GEBREK AAN EENHEID VAN UITVINDING

Octrooiaanvrage Nr.:
SN 63233
NL 2013596

AANVULLINGSBLAD B

De Instantie belast met het uitvoeren van het onderzoek naar de stand van de techniek heeft vastgesteld dat deze aanvrage meerdere uitvindingen bevat, te weten:

1. conclusies: 1-10

   Vibration-isolating insert with an elongate strip of vibration-isolating material with lateral edges made either of a series of discrete hooks or a L-shape profile, both being made of plastic material which is more rigid than the vibration-isolating material,

   ---

2. conclusies: 11-16

   Method for manufacturing a vibration-isolating insert using extrusion methods comprising the step of extruding a strip of vibration-isolating material and a strip of plastic material having a profiles section with hook formed at the lateral side of the strip, with the plastic material being more rigid than the vibration-isolating material.

   ---

3. conclusies: 17-19

   Method for manufacturing a vibration-isolating insert using the step of overmoulding an insert made of hooks separated by a bridge of plastic material in a strip of vibration-isolating material

   ---

Het vooronderzoek werd tot het eerste onderwerp beperkt.

ONDERZOEKSRAPPORT BETREFFENDE HET RESULTAAT VAN HET ONDERZOEK NAAR DE STAND VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE

Informatie over leden van dezelfde octrooifamilie

Nummer van het verzoek om een onderzoek naar de stand van de techniek
NL 2013596

In het rapport genoemd octrooigeschrift	Datum van publicatie	Overeenkomend(e) geschrift(en)	Datum van publicatie
DE 102007052701 A1	07-05-2009	DE 102007052701 A1	07-05-2009
		DE 102008012823 A1	10-09-2009
EP 2133617 A1	16-12-2009	AT 458164 T	15-03-2010
		CA 2651531 A1	03-01-2008
		DK 2032887 T3	07-06-2010
		EA 200970060 A1	30-06-2009
		EP 2032887 A2	11-03-2009
		EP 2133617 A1	16-12-2009
		ES 2337950 T3	30-04-2010
		NL 1032064 C2	02-01-2008
		US 2009314904 A1	24-12-2009
		WO 2008002129 A2	03-01-2008
EP 0413883 A1	27-02-1991	AT 92600 T	15-08-1993
		DE 8910177 U1	28-12-1989
		DE 59002173 D1	09-09-1993
		DK 0413883 T3	13-12-1993
		EP 0413883 A1	27-02-1991
		ES 2045566 T3	16-01-1994

WRITTEN OPINION

File No.	Filing date *(day/month/year)*	Priority date *(day/month/year)*	Application No.
SN63233	08.10.2014		NL2013596

International Patent Classification (IPC)
INV. F16L55/035 F16L3/08

Applicant
J. van Walraven Holding B.V.

This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☒ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the application
- ☐ Box No. VIII Certain observations on the application

	Examiner
	Fromentel, Henri

WRITTEN OPINION

Box No. I Basis of this opinion

1. This opinion has been established on the basis of the latest set of claims filed before the start of the search.

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the application and necessary to the claimed invention, this opinion has been established on the basis of:

   a. type of material:

   ☐ a sequence listing

   ☐ table(s) related to the sequence listing

   b. format of material:

   ☐ on paper

   ☐ in electronic form

   c. time of filing/furnishing:

   ☐ contained in the application as filed.

   ☐ filed together with the application in electronic form.

   ☐ furnished subsequently for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

WRITTEN OPINION

Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step, or to be industrially applicable have not been examined in respect of

☐ the entire application

☒ claims Nos. 11-19

because:

☐ the said application, or the said claims Nos. relate to the following subject matter which does not require a search *(specify)*:

☐ the description, claims or drawings *(indicate particular elements below)* or said claims Nos. are so unclear that no meaningful opinion could be formed *(specify)*:

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed *(specify)*:

☒ no search report has been established for the whole application or for said claims Nos. 11-19

☐ a meaningful opinion could not be formed as the sequence listing was either not available, or was not furnished in the international format (WIPO ST25).

☐ a meaningful opinion could not be formed without the tables related to the sequence listings; or such tables were not available in electronic form.

☐ See Supplemental Box for further details.

Box No. IV Lack of unity of invention

1. The requirement of unity of invention is not complied with for the following reasons:

   see separate sheet

2. This report has been established in respect of the following parts of the application:

   ☐ all parts.

   ☒ the parts relating to claims Nos. (see Search Report)

WRITTEN OPINION

Box No. V Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty	Yes:	Claims	1-8, 10
	No:	Claims	9
Inventive step	Yes:	Claims	1-8, 10
	No:	Claims	9
Industrial applicability	Yes:	Claims	1-10
	No:	Claims	

2. Citations and explanations

see separate sheet

Reference is made to the following documents:

D1 DE 10 2007 052701 A1 (FISCHERWERKE GMBH & CO KG [DE]) 7 mei 2009 (2009-05-07)

D2 EP 2 133 617 A1 (WALRAVEN HOLDING BV J VAN [NL]) 16 december 2009 (2009-12-16)

D3 EP 0 413 883 A1 (POPPE & CO GIESSENER GUMMIWARE [DE]) 27 februari 1991 (1991-02-27)in de aanvraag genoemd

Re item IV

IV. 1

The separate inventions are:

claims: 1-10

Vibration-isolating insert with an elongate strip of vibration-isolating material with lateral edges made either of a series of discrete hooks or a L-shape profile, both being made of plastic material which is more rigid than the vibration-isolating material,

claims: 11-16

Method for manufacturing a vibration-isolating insert using extrusion methods comprising the step of extruding a strip of vibration-isolating material and a strip of plastic material having a profiles section with hook formed at the lateral side of the strip, with the plastic material being more rigid than the vibration-isolating material.

claims: 17-19

Method for manufacturing a vibration-isolating insert using the step of overmoulding an insert made of hooks separated by a bridge of plastic material in a strip of vibration-isolating material

The features common to apparatus claims 1-10, the method claim 11-16 and the method claims 17-19 are :

an elongate strip of vibration-isolating material having a profile section formed at the lateral side made of plastic material.

These features forms **the single general concept** of the above mentioned groups of claims.

IV. 2

- The remaining features of independent claim 1 or 9 concern the plastic material being more rigid than the vibration-isolating material and the profile section being either hooks or L-shape profile being exposed or protruding from the pipe clip facing side.

It solves the technical problem of **improving the gripping of the profile section to the pipe clip.**

- The remaining features of claim 11 resp. 16 concern the plastic material being more rigid than the vibration-isolating material and the removing of a transverse section of the strip of plastic material at constant intervals.

It solves the technical problem of **easing the bending of the insert to conform to the bending radius of the pipe clip.**

- The remaining features of claim 17 concern overmoulding with vibration-isolating material hooks units comprising two hooks joined by a bridge of plastic material, at least partially embedded in the vibration-isolating material.

It solves the technical problem of **simplifying the manufacturing process by using insert moulding instead of multiple/co-extrusion processes**

Each of these groups of claims comprise different technical features and solve distinct technical problem, they can therefore not be seen as corresponding and do not form a single general concept which is, thus, limited to an elongate strip of vibration-isolating material having a profile section formed at the lateral side and made of plastic material.

IV.3

However, D1, see figure 4, disclose an elongate strip (1) of vibration-isolating material (4) having a profile section formed at the lateral side (7) and made of plastic material (see [0021]). Thus, the single general concept is not new in light of D1 and is consequently not an invention.

Therefore, the above mentioned groups of claims are **not linked** by a single general **inventive** concept and consequently, these groups do not satisfy with the requirement of unity of invention a posteriori.

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Claim 9 resp. 10

The present application does not meet the criteria of patentability, because the subject-matter of claim 9 is not new

D1 discloses :

a vibration-isolating insert (fig 4) suitable for a pipe clip (3, fig 3), the vibration-isolating insert being adapted to bear against an inner circumference of a substantially annular pipe clip body and ultimately - in use - to be positioned between the outer circumference of a pipe and the pipe clip body, the vibration-isolating insert comprising

an elongate strip (4, fig 4) of vibration-isolating material (see [0021]) and having a pipe facing side (top of figure 4)

and a pipe clip facing side (bottom of fig 4), wherein the vibration-isolating insert has along each of the lateral edges at the pipe clip facing side a substantially L-shaped profile (see figure 4), the L-shaped profile having a first leg (5) extending in alignment with the lateral side of the strip and a second leg (6) extending from the first leg in a transverse direction (see figure 4), wherein the first leg is made of vibration isolating material (5) and the second leg is made of a plastic material (7) which is more rigid than the isolating vibration material (see [0022], last sentence)

thus, the subject matter of claim 9 lacks of novelty in light of document D1.

2. Claim 1

D2 is regarded as being the prior art closest to the subject-matter of claim 1 and discloses

a vibration-isolating insert 850, fig. 5) suitable for a pipe clip (1, fig 1), the vibration-isolating insert being adapted to bear against an inner circumference of a substantially annular pipe clip body (see fig 1) and ultimately - in use - to be positioned between the outer circumference of a pipe and the pipe clip body (see fig 1), the vibration-isolating insert comprising an elongate strip (50a) of vibration-isolating material ([0045]) which has a pipe facing side (bottom fig. 5) and a pipe clip facing side (top, fig 5), said strip of vibration-isolating material having adjacent either lateral edge (52) thereof a series of discrete hooks (57, fig 6) which is more rigid than the vibration-isolating material.

The subject-matter of claim 1 therefore differs from this known insert in that the series of discrete hooks is exposed and the hooks are protruding relative to the pipe clip facing side of the strip of vibration-isolating material (see figure 5) and that these hooks are made of plastics material

and **is therefore new.**

The technical effect of the difference is to allow the insert to improve the gripping with the pipe clip while still permitting an easy bending capacity to conform itself with the clip bending radius and at the same time, with hooks made of plastic material, to enlarge the design possibilities of the hook made of plastic versus hooks made of metal.

The problem to be solved by the present invention may therefore be regarded as to improve the capacity of the insert to withstand longitudinal forces that may occur between the insert and the clip during the introduction of the pipe in the clip.

The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step for the following reasons: the combination of the hook made of plastic material and the hooks being exposed and not fully embedded in the vibration isolating material is not disclosed or suggest by the available and searched prior documents. Thus, the skilled person confronted by the problem posed by the invention would not have been motivated to modify the known insert of D1 in order to use at the same time an alternative material and a modified design for the discrete hooks being exposed and protruding from the pipe clip facing side and thus, the subject matter of claim 1 involves an inventive activity.

Claims 2-8 resp.10 are dependent on claim 1 and as such also meet the requirements of novelty and inventive step.