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(54) Title: IMPROVED ANIMAL TAG

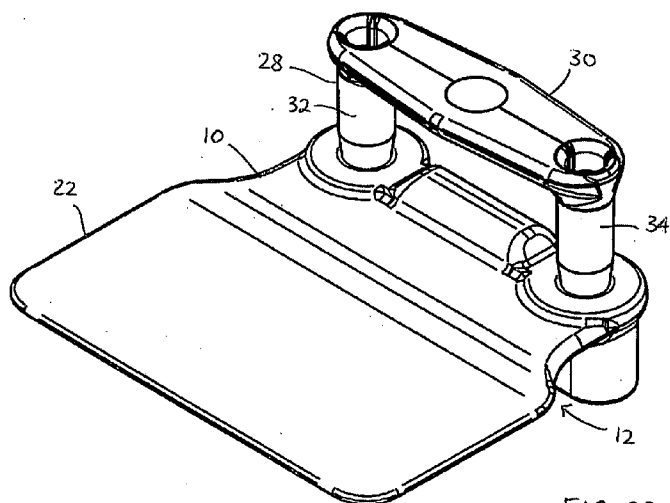


FIG. 2B

(57) Abstract: A tag for attachment to an animal including: a transponder casing (40) housing a transponder; a cartridge (22) for housing the transponder casing; a female component (10) and a male component (28) adapted to engage one another; said male component (28) having a pair of penetrating members (32, 34) and said female component (10) having a pair of apertures (14, 16), each aperture arranged to receive and retain a respective penetrating member when applied by an applicator through skin of the animal; wherein the cartridge (22) and transponder casing (40) are encapsulated within said tag to prevent dislodgment, movement or damage to the transponder.



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AN ANIMAL TAG INCLUDING A TRANSPONDER CASING HOUSED IN A CARTRIDGE

FIELD OF THE INVENTION

This invention relates to an improved animal tag and more particularly to an improved ear tag that includes an encapsulated transponder.

5

BACKGROUND OF THE INVENTION

In order to identify animals, such as cattle and sheep, ear tags have been used with transponders for a number of years. The transponder is usually embedded within the ear tag and whenever the animal is within range of a receiver, the information and identity stored in the transponder can be extracted.

The ear tags incorporating a transponder are currently made in a two part process called "clip and cap". The mould for the ear tag is made in two parts whereby the transponder is placed in one part of the mould and the second part, being the cap, is placed on top of the enclosed transponder and the two mould parts are welded together. Thus the transponder is welded into the identification tags, generally be one of two types of welding. A set of forks holds the transponder in the encapsulation. Using ultrasonic welding, the set of forks can bend or even break which weakens the hold of the transponders, making them loose within the tag and susceptible such that the transponders can fail. Ultrasonic welding or frictional welding weld polyurethane together and is subject to external shock, bumps and vibrations that makes the transponder vulnerable and therefore the information stored in the transponder can be affected. A lack of sufficient plastics material around the transponder leads to breakage of the transponder using these types of welding.

Other attempts to secure a transponder within an ear tag and to prevent dislodgement therefrom, for example, by cattle or sheep rubbing an ear or body against an object, have also used ultrasonic welding. However this technique has in many cases damaged the transponder and/or not provided an intact and secure seal for the transponder.

The present invention seeks to overcome at least one of the abovementioned disadvantages, including providing a robust animal tag with embedded transponder that withstands harsh treatment by an animal to which the tag is attached. The present invention also seeks to increase protection around the transponder by providing a cartridge or animal tag that substantially prevents internal movement of the transponder with increased rigidity and more material around the transponder.

SUMMARY OF THE INVENTION

According to a first aspect of the invention, there is provided a tag for attachment to an animal including:

- 5 a transponder casing housing a transponder;
 a cartridge for housing the transponder casing;
 a female component and a male component adapted to engage one another;
 said male component having a pair of penetrating members and said female
 component having a pair of apertures, each aperture arranged to receive and retain a
10 respective penetrating member when applied by an applicator through skin of the animal;
 wherein the cartridge and transponder casing are encapsulated within said tag to
 prevent dislodgment and/or movement and/or damage to the transponder.

According to a second aspect of the invention, there is provided a method of forming an animal tag component encapsulating a transponder casing, including the steps
15 of:

- positioning and securing a transponder casing that houses the transponder in a
 cartridge;
 securing the cartridge in a mould;
 enabling or injecting liquid material to flow in the mould to completely enclose
20 the cartridge and the transponder casing;
 setting the material to form the animal tag component.

According to a third aspect of the invention, there is provided a cartridge forming part of an animal tag, including:

- an elongate integral shell defining a space to house a transponder casing, said
25 shell having an opening extending along the length of the shell to enable insertion of the
 transponder casing;
 a set of clips extending from sides of the opening to retain the transponder casing
 in the space;
 wherein the cartridge and transponder casing are encapsulated within said tag to
30 prevent dislodgment and/or movement and/or damage to the transponder.

BRIEF DESCRIPTION OF THE DRAWINGS

A preferred embodiment of the invention will hereinafter be described, by way of example only, with reference to the figures in which:

Figure 1A is a perspective view of a female component of an animal tag having a transponder and cartridge encapsulated therein;

5 Figure 1B is a perspective view of the tag showing a male component engaged with the female component of Figure 1A;

Figure 2A is a perspective view of a modified female component of the animal tag shown in Figure 1A having a flag or extending portion for labelling;

10 Figure 2B is a perspective view showing a male component engaged with the female component of Figure 2A to form the animal tag;

Figure 2C is an underneath perspective view of the modified female component of Figure 2A;

Figure 3A is a plan view of the female component of the tag;

15 Figure 3B is an underneath view of the female component of the tag of Figure 3A showing the cartridge;

Figure 4A is a sectional view of the female component taken along the line A-A in Figure 3B;

Figure 4B is a sectional view of the female component taken along the line B-B in Figure 3B;

20 Figure 4C is a sectional view of the female component along the line C-C in Figure 3B;

Figure 4D is a sectional view taken along the line D-D of the female component across the cartridge and transponder casing in Figure 3B;

25 Figure 5 is a perspective view of the cartridge of Figure 3A and 3B in which a transponder is shown fitted;

Figure 6A is a plan view of the female component of the tag according to a further embodiment;

Figure 6B is an underneath view of the female component of the tag of Figure 6A showing the cartridge;

30 Figure 7A is a sectional view of the female component taken along the line A-A in Figure 6B;

Figure 7B is a sectional view of the female component taken along the line B-B in Figure 6B;

Figure 7C is a sectional view of the female component along the line C-C in Figure 6B;

Figure 7D is a sectional view taken along the line D-D of the female component across the cartridge and transponder casing in Figure 6B;

5 Figure 8 is a perspective view of the cartridge of Figures 6A and 6B in which a transponder is shown fitted;

Figures 9A and 9B show a series of perspective views depicting a further embodiment of a female component of an animal tag having a transponder and cartridge encapsulated therein; and

10 Figure 9C is a series of perspective views depicting a complete assembled tag with a male component fitted to the female components shown in Figures 9A and 9B.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference to Figures 1A, 2A and 2C, there is shown a perspective view of a female component (10) of an animal tag, in particular an ear tag. The female component (10) is formed by an over-moulding process which fully encapsulates a cartridge (12) which houses a transponder. The process will be described hereinafter. The female portion or component (10) has a pair of apertures (14, 16) formed in respective support members (18, 20). The cartridge (12) is positioned in a laterally extended portion (22) of the female portion, the portion (22) extending outwardly and between each of the support members (18, 20). The flag or extended portion can be used to print information to identify the animal or owner or details about the transponder, for example. Located between the support members (18, 20) is an intermediate member (24) which includes a raised section (26) which enables air to flow against the skin of the animal when the ear tag is assembled on the animal, in order to assist in healing the wound created by tagging the animal.

Referring to Figures 1B and 2B, there is shown a male component (28) fully engaged with the female component (10), which is applied by an applicator having a pair of prongs. The male portion (28) has an intermediate portion (30), with substantially no overhang, and a pair of penetrating members (32, 34) which are applied by the applicator, and fit within apertures (14, 16) and are retained within the support structures (18, 20) which lock respective heads of the penetrating members (32, 34) in position so that the male component (28) cannot be dislodged from the female component (10) when fitted to

the animal. The prongs of the applicator are fitted within respective apertures (36, 38) and when pressure is applied to the applicator, the penetrating heads of the penetrating members (32, 34) pierce the skin of the animal and are secured in the corresponding female component (10) on the other side of the skin fold, which is usually an ear of the animal. The tags shown in Figures 1B and 2B are particularly suited for application to cattle ears.

Referring to Figure 3A there is shown a top view of the female component (10). It shows transponder casing (40), which houses a transponder, fitted within cartridge (12). Figure 5 also shows the same arrangement whereby the transponder is fitted or encased by a transponder casing (40). The transponder casing (40) is preferably in the form of a glass tube or a plastic tube, both known for their strength and rigidity properties. The transponder casing (40) is fitted through an open portion of the cartridge (12) and is secured in place via clips extending inwardly across the open portion from each of the sides (42, 44) of the cartridge (12). The clips (46, 48, 50, 52) are more clearly seen in Figure 3A. The casing (40) enclosing the transponder is robust and although less flexible can withstand the pressure and temperature involved with the over-moulding process whereby most of the transponder casing comes into contact with the material used to make the female component (10).

Figures 4A, 4B, 4C and 4D respectively show sectional views of the female component (10) along corresponding lines A-A, B-B, C-C and D-D in Figure 3B.

Referring to Figure 5 there is shown a cartridge (12) in which the transponder casing (40) is fitted. The cartridge (12) includes a handle (54) and protuberances (58, 60, 62, 64, 66, 68, 70, 72, 76) which enable the cartridge (12) to be held and located within a tool used in the moulding process. Essentially part of the mould or a mould tool holds the cartridge (12) in place and the protuberances (58) to (76) assist the positioning of the cartridge (12) and allow space for flowable liquid material to flow through and encapsulate the cartridge (12) and the transponder during the moulding process. By placing the transponder casing (40) within the cartridge (12) provides rigidity and protection against vibration, against vigorous external forces in the field applied by animals rubbing ears against an object, and protection against pressure and temperature involved in the over moulding process.

Figures 6A and 6B are similar in appearance to, and are similarly described with like reference numerals to Figures 3A and 3B respectively. Two particular differences exist

in the embodiments of Figures 6A, 6B and 8 when compared respectively to Figures 3A, 3B and 5. The protuberances (59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81 and 83) are different to those of (58, 60, 62, 64, 66, 68, 70, 72 and 76) in shape and location.

Furthermore in the embodiment of Figure 8 there is no corresponding handle (54) with apertures therethrough. Each of the protuberances in both embodiments of Figures 5 and 8 are designed to locate the cartridge (12) into the other half of the over-moulding tool (and push against this other half) as the tool closes and after the cartridge (12) has been placed in one half of the tool. If these protuberances were not there then the plastics material of polyurethane would not have room or space to fill and cover the cartridge (12) and casing (40). They provide an essential gap to allow the flowable plastics material to form around the cartridge (12) and casing (40). Another difference is that the cartridge (12) of Figure 8 does not have any openings such as (80), (82), (84) or (86). Instead, during the over-moulding process (further described below), the polyurethane is injected through the tool and through the eventual formation of one or both of the support members (18, 20) (or tag caps), for example anywhere on surfaces (120) or (122), which then is forced downwardly into the long opening (93) into which the casing (40) is fitted. From there the flowable plastics material is forced down the sides or walls of the casing (40) to consolidate the transponder and its casing (40) within the cartridge (12). Furthermore, a small gap exists between the tool and the bottom of the cartridge (12) made possible by protuberances (70) and (75) for example, and this space/gap is filled by the plastics material ensuring that the whole transponder, transponder casing (40) and cartridge (12) are encapsulated by the plastics material.

The clips (46, 48, 50, 52) of Figures 3A and 5 are slightly different to corresponding clips (85, 93, 89, 87) in Figures 6a and 8 in that the latter clips are effectively beads. These hold the casing (40) in place within the cartridge (12) when fitted within the over-moulding tool and during the over-moulding process. They also assist in attaching the casing (40) to the respective open half of the over-moulding tool.

Figures 7A, 7B, 7C and 7D respectively show sectional views of the female component (10) along corresponding lines A-A, B-B, C-C and D-D in Figure 6B.

The preferred plastics material from which the male component (28) is made is Nylon 6, but it can also be polyurethane. The female component (10), which uses an over moulding process to fully encapsulate the transponder casing (40) and cartridge (12) uses polyurethane at a Shore Hardness of between 93A and 97A. The female component

(10) can be made from other materials. The penetrating components and penetrating members of the male component (28) preferable use a Shore Hardness in the range of 70D to 90D, preferably 75D to 80D, or alternatively a Rockwell Hardness in the range (R) R95 to (R) R120. The cartridge (12) is either made from glass filled nylon at
5 between 20% to 30%, polycarbonate or acetyl and is moulded from a specific moulding tool. The cartridge (12) has openings (80, 82, 84, 86), more clearly seen in Figures 3A and 3B, to enable molten or liquid plastic polyurethane to flow through and around the cartridge (12) and transponder casing (40). By having these openings, it enables the cartridge (12) to withstand the pressure and temperature of the over moulding process in
10 which the polyurethane is injected. The melting point of the polyurethane is 190° and the process of over moulding takes part at the approximately temperature of 210°C.

After loading a transponder into the cartridge (12), the loaded cartridge (12) is placed in an over-moulding tool and is then moulded to form the polyurethane covering. The actual process of the injection moulding takes place through either or both surfaces
15 (120) or (122) when it is positioned in the over-moulding tool. The polyurethane is melted to the approximate temperature of 210°C and then once injected it flows to fill the areas around the transponder casing (40) and the cartridge (12) and then outwardly to fill the areas defined by the support structures (18, 20), the extended portion (22) and the connecting portion (24) which has the raised section (26). After about 10 to 15 minutes,
20 the newly formed female component cools to room temperature and fully cures within 48 hours. The complete unit is as shown in Figure 1A. A small thickness of polyurethane extends around the outer perimeter of the cartridge (12) and over the top of the major opening of the cartridge (12) which forms a substantially flat top of the extended portion (22) up to the raised section (26).

25 During the over-moulding process, the temperature range used for heating the raw materials in the mould to form the completed tag are controlled by a specific machine. The temperature used varies depending upon the position of a set screw used in the over-moulding process. Once the material is injected into the cavities of the tool/mould, which can include gates and runners, the material temperature is increased due to the
30 material being sheared through different parts of the tool/mould through the various runners and gates. The temperature inside the cavities of the mould/tool can be varied by increasing or decreasing the number of runners and gates. These runners and gates are

needed during the over-moulding process to ensure that the transponders remain intact and functioning.

At least three different types of tags can be produced by the over-moulding process, including an ET40 which is used for cattle and is tamper-proof, an ET45 used for sheep
5 which is also tamper-proof and an ET46 for sheep which is not tamper-proof. The ET46 tag can be reused by the end user.

A space exists between a respective end of the transponder casing (40) and an inner protuberance (91) located on the inside of each end (90, 92) of cartridge (12). This enables a cut to be made in the cartridge (12) at each end (90, 92) when the transponder
10 casing and transponder are no longer required or need to be replaced. Once the ends are cut, an elongate object can be used to push the casing (40) out of the cartridge (12). Both the transponder and transponder casing can be recycled for further use. Alternatively, a slit may be cut through the flat portion of the polyurethane covering of the female component(10), as indicated at (95) in Figure 4A, above the transponder casing (40).
15 Once the slit is cut, then the transponder casing (40) can be removed from the cartridge (12) and the transponder reused.

Referring to Figures 9A and 9B there is shown a series of views of a female component (100) of a tag particularly suited to apply to sheep. Instead of the extended portion (22) of the embodiment of Figures 1A, 1B, 2A and 2B being lateral, the
20 component (100) has a downwardly depending extended portion (112) below and between two support structures (102, 104) that respectively include apertures (106, 108) for receiving respective penetrating members of a male component of the tag. Bridging the two support structures (102, 104) is an intermediate portion (105) having a raised section (107) to provide clearance for air to pass over the skin of the sheep when the tag
25 is fitted to the sheep. At the bottom of the depending extended portion (112) is a portion (110) in which is housed the cartridge and transponder casing. The female component (100) is produced by the same over-moulding process described in relation to Figures 1 to 4. In Figure 9C shows perspective views of a male portion or component (101) fitted to the female component (100) as a completely assembled tag (109). Penetrating
30 member (103) of portion (101) fits into support structure (102) while penetrating member (105) fits into support structure (104).

CLAIMS:

1. A tag for attachment to an animal including:
a transponder casing housing a transponder;
5 a cartridge for housing the transponder casing;
a female component and a male component adapted to engage one another;
said male component having a pair of penetrating members and said female
component having a pair of apertures, each aperture arranged to receive and retain a
respective penetrating member when applied by an applicator through skin of the animal;
10 wherein the cartridge and transponder casing are encapsulated within said tag to
prevent dislodgment or damage to the transponder.
2. A tag according to claim 1 wherein the cartridge and transponder casing are
encapsulated in the female component.
15
3. A tag according to claim 1 wherein the cartridge and transponder casing are
encapsulated in the male component.
4. A tag according to claim 3 wherein the cartridge includes a full opening on one
20 side of the cartridge to enable insertion and extraction of the transponder casing.
5. A tag according to claim 3 wherein the cartridge includes a full opening on one
side of the cartridge to enable liquid material to flow in and around said cartridge during
an over-moulding process.
25
6. A tag according to further including an extending projection in the female
component in which the cartridge and transponder casing are positioned.
7. A tag according to claim 5 wherein the cartridge is rounded on a side opposite to
30 the full opening and substantially flat on the side of the full opening.
8. A tag according to any one of the preceding claims wherein a gap exists at each
end of the cartridge when the transponder casing is positioned therein, in order to enable

a cut to be made in the cartridge to release the transponder casing for reuse of the transponder.

9. A tag according to claim 5 wherein the encapsulating material surrounding the cartridge is cut in line with said full opening in the cartridge in order to remove the transponder casing from the cartridge and to enable reuse of the transponder.
10. A method of forming an animal tag component encapsulating a transponder casing, including the steps of:
- 10 positioning and securing a transponder casing that houses the transponder in a cartridge;
- securing the cartridge in a mould;
- injecting/enabling liquid material to flow in the mould to completely enclose the cartridge and the transponder casing;
- 15 setting the material to form the animal tag component.
11. A method according to claim 10 wherein the cartridge has an opening to enable the liquid material to flow in and around the cartridge and around the transponder casing.
- 20 12. A method according to claim 10 or claim 11 wherein the liquid material is injected/inserted into at least two parts of the mould adjacent the cartridge.
13. An animal tag component resulting from the method of claim 10.
- 25 14. A cartridge forming part of an animal tag, including:
- an elongate integral shell defining a space to house a transponder casing; said shell having an opening extending along the length of the shell to enable insertion of the transponder casing;
- a set of clips extending from sides of the opening to retain the transponder casing
- 30 in the space;
- wherein the cartridge and transponder casing are encapsulated within said tag to prevent dislodgment and/or movement and/or damage to the transponder.

1/8

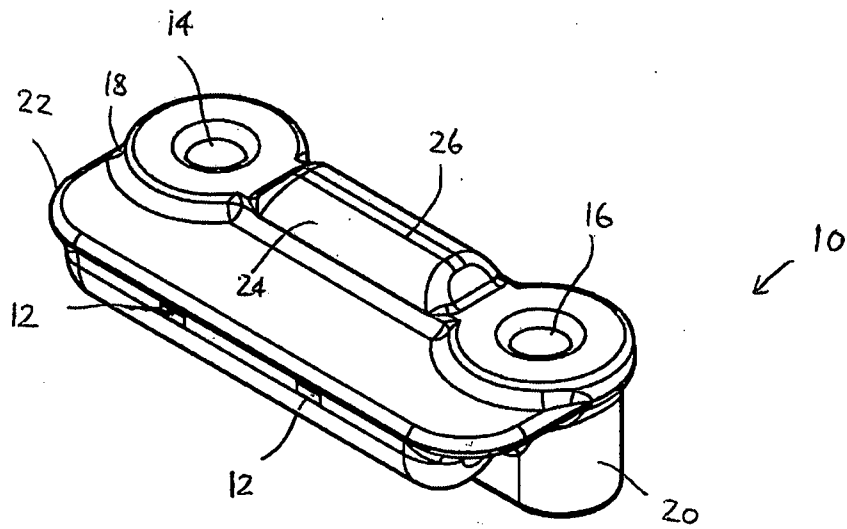


FIG. 1A

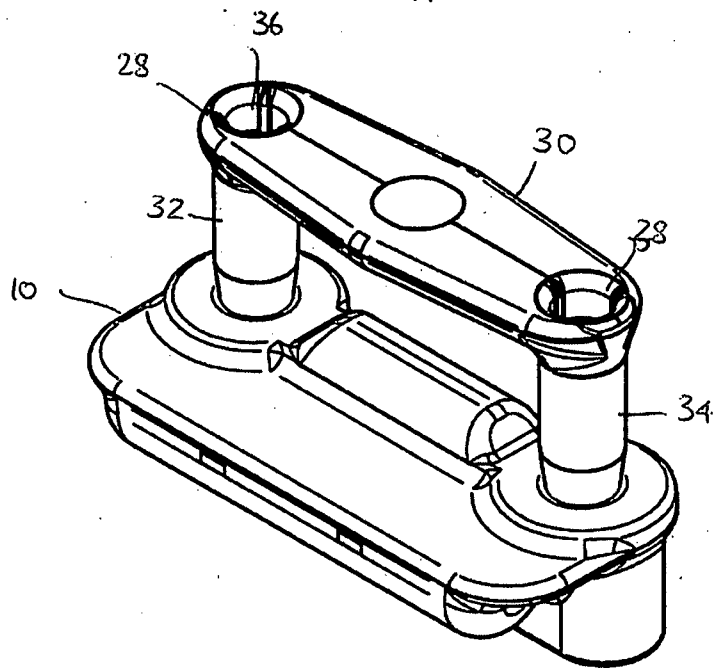


FIG. 1B

2/8

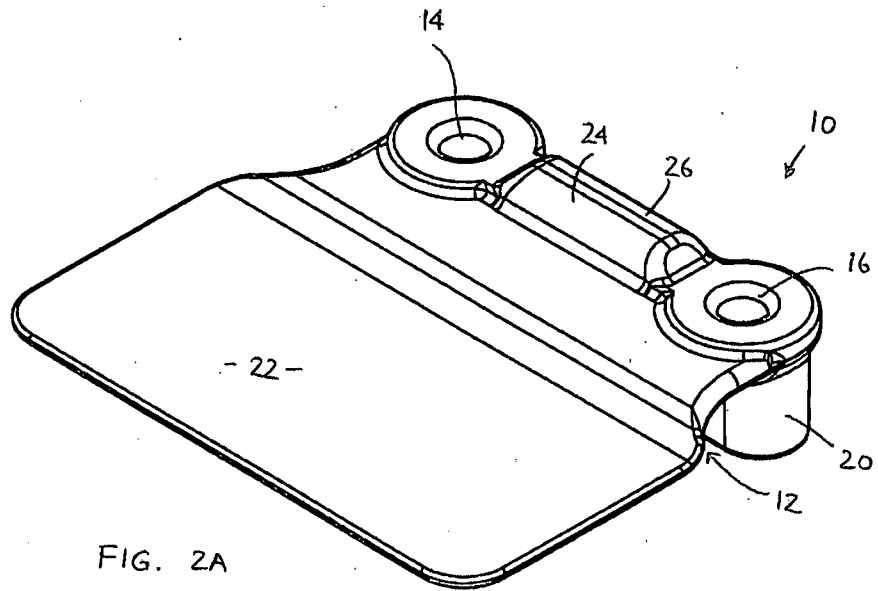


FIG. 2A

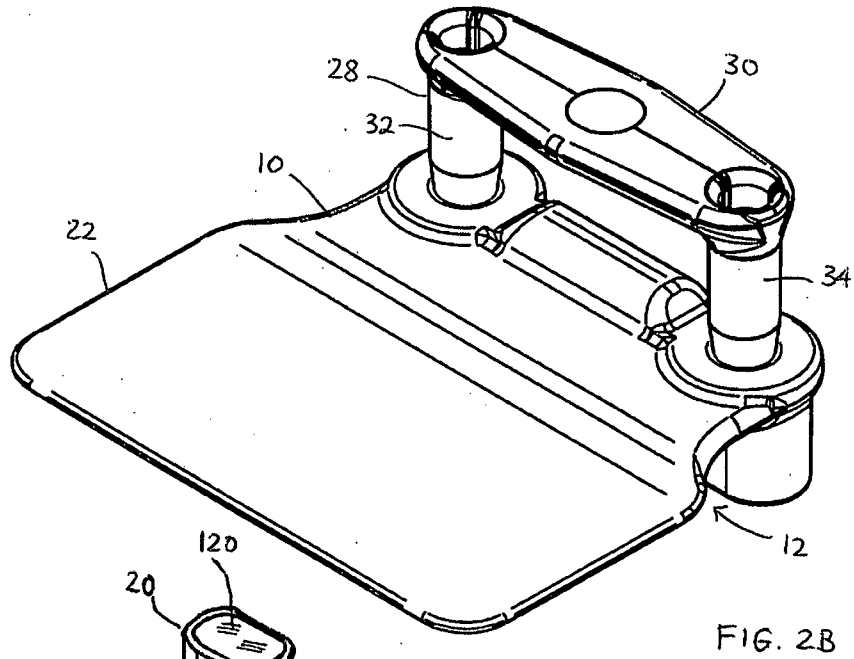


FIG. 2B

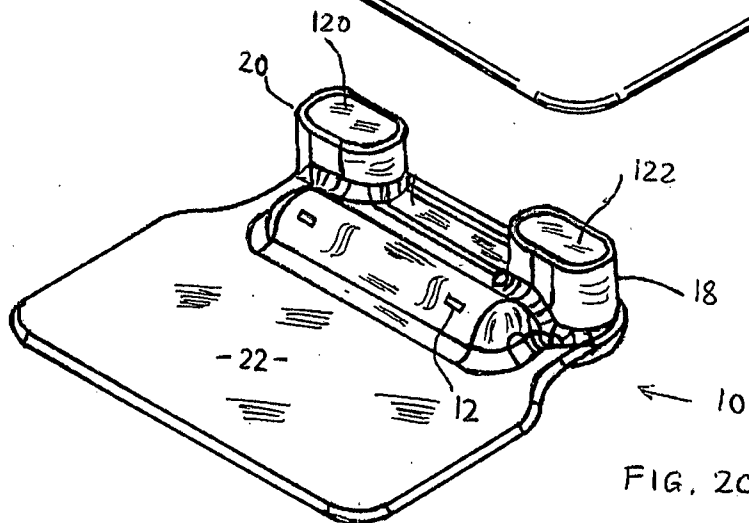


FIG. 2C

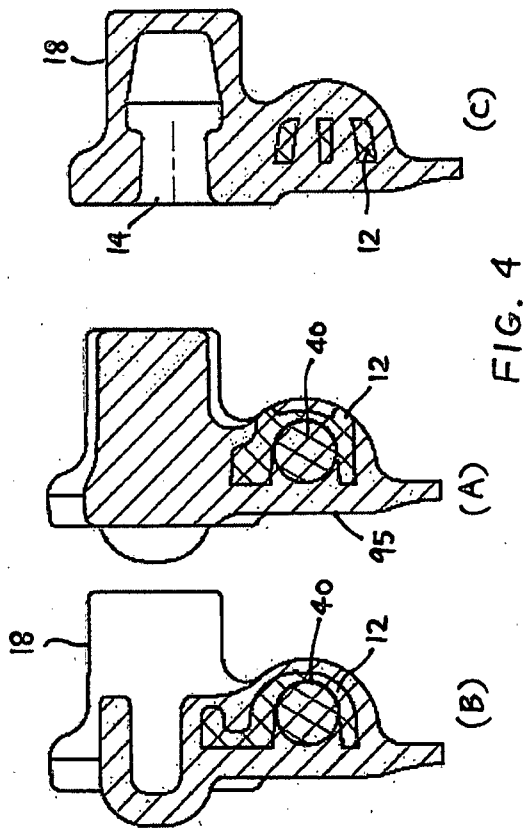
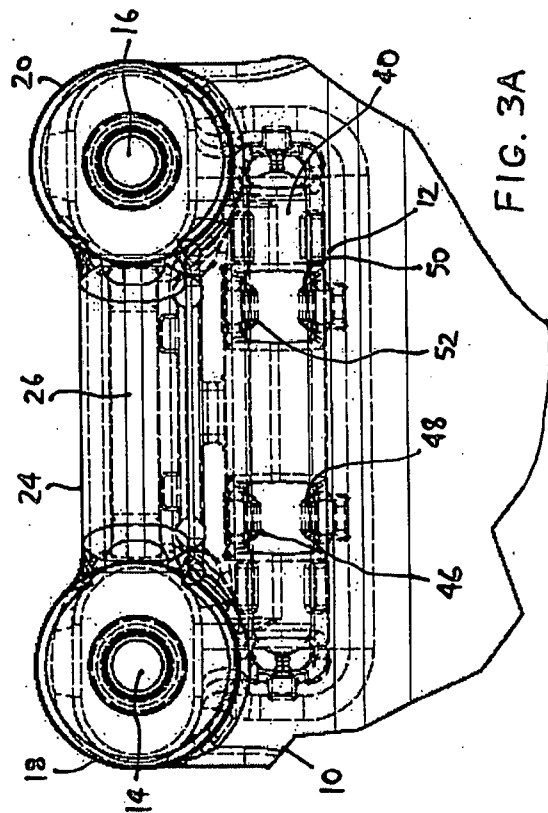
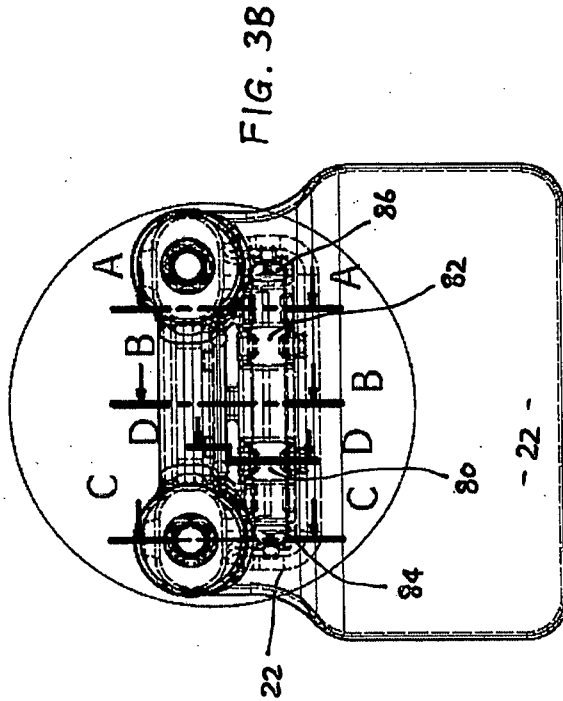


FIG. 4



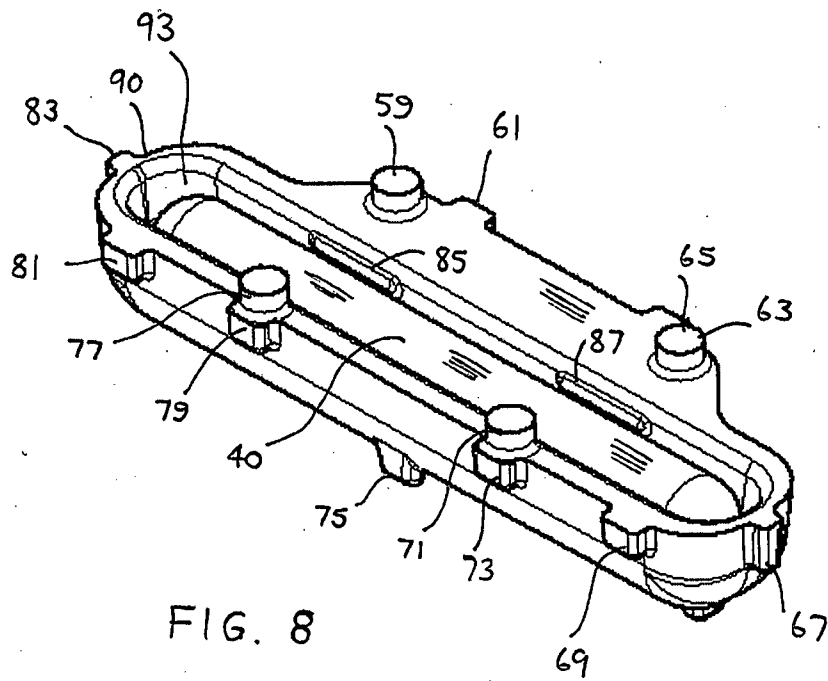


FIG. 8

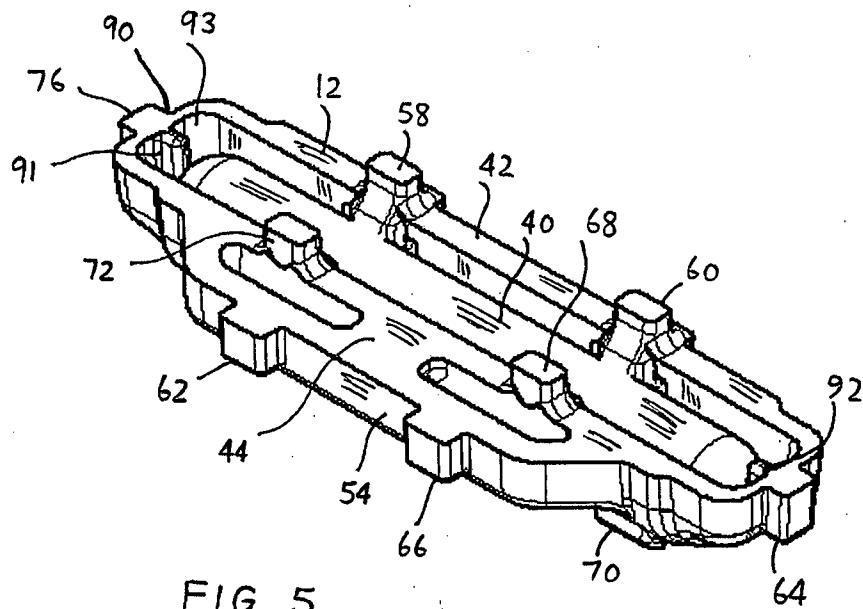


FIG. 5

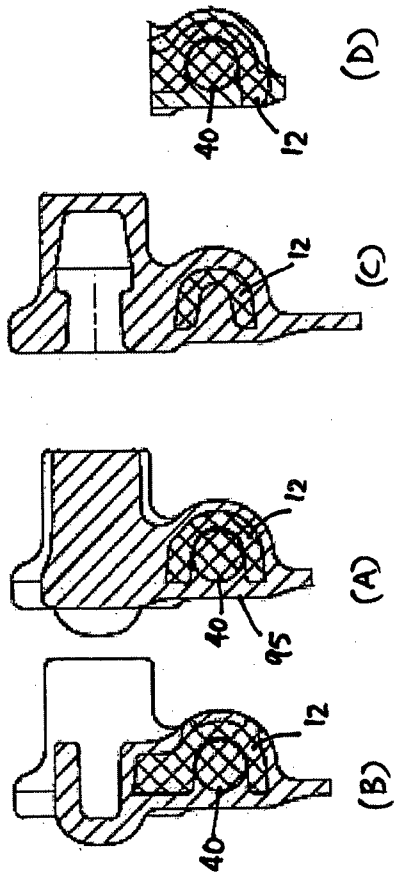


FIG. 7

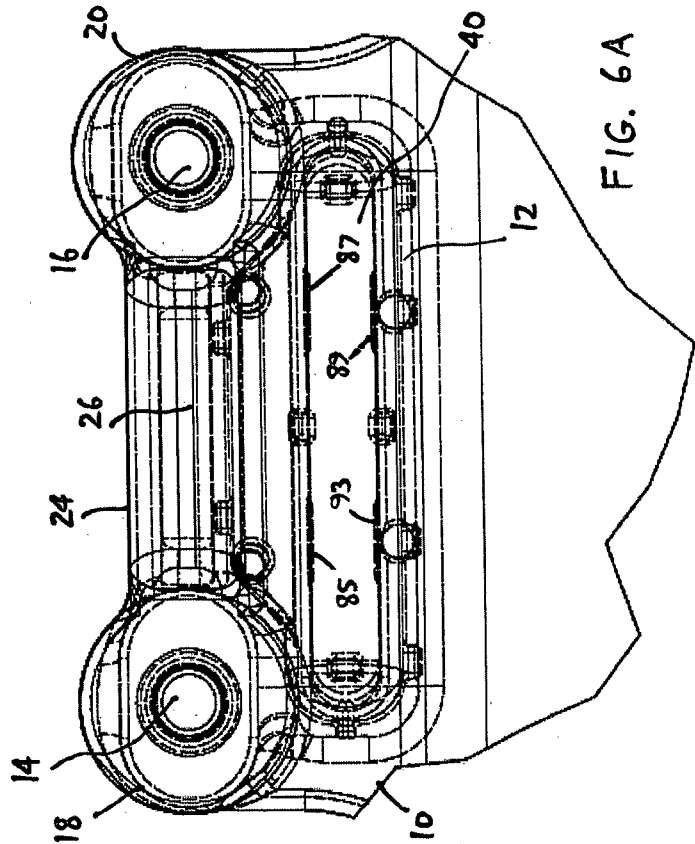


FIG. 6A

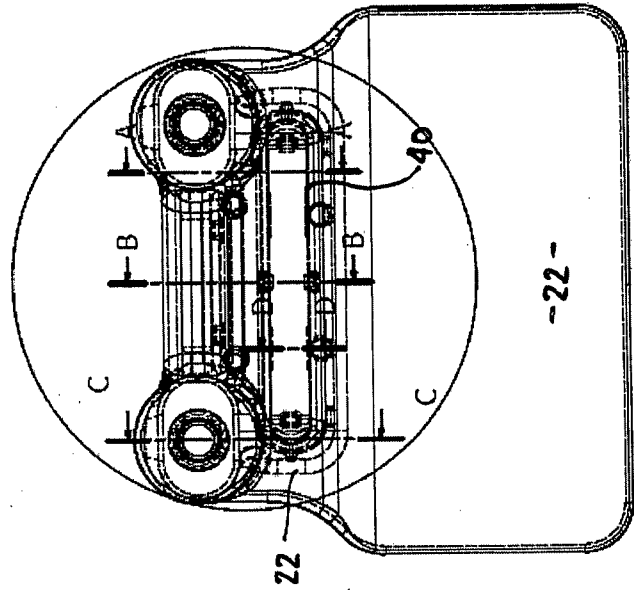
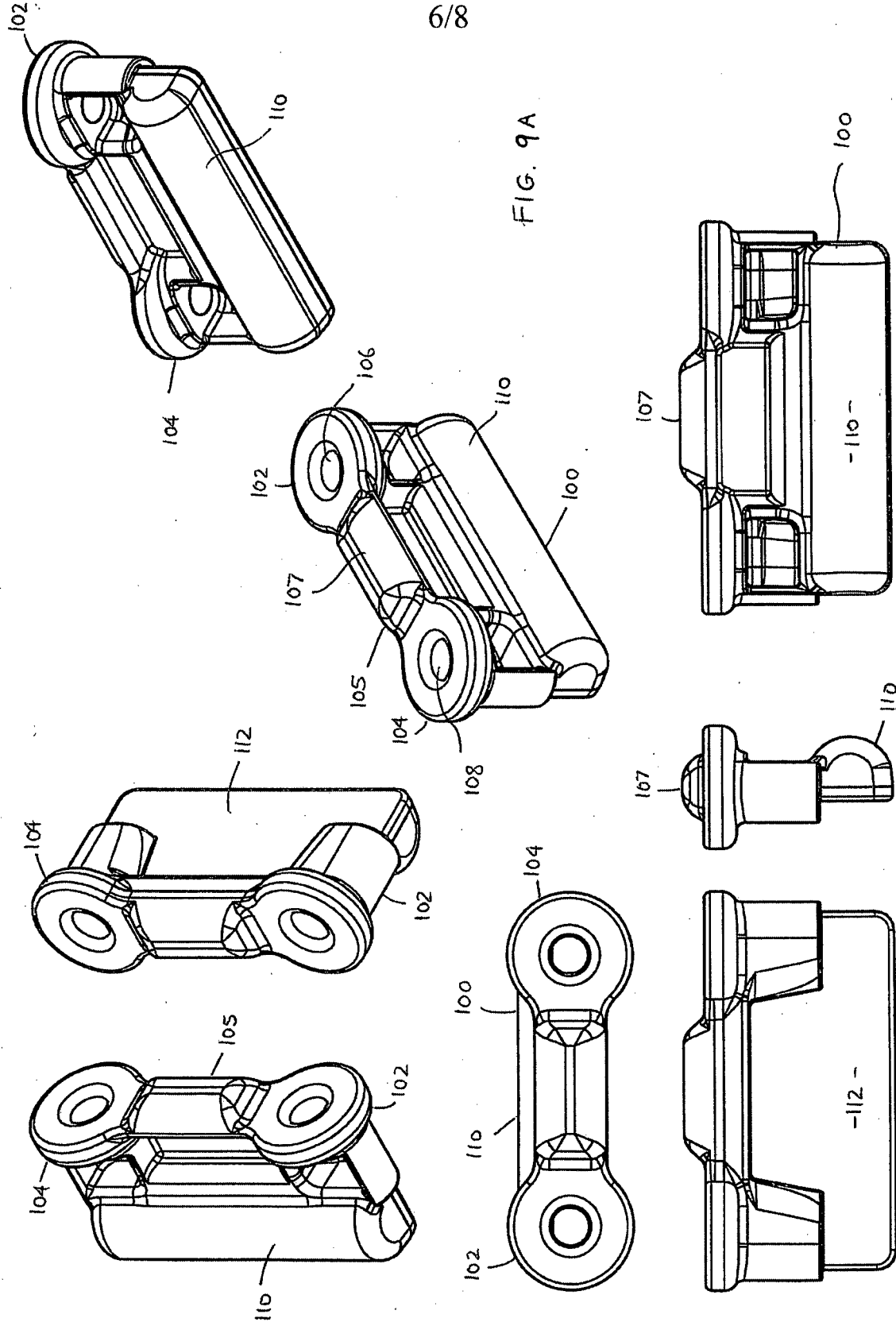


FIG. 6B



7/8

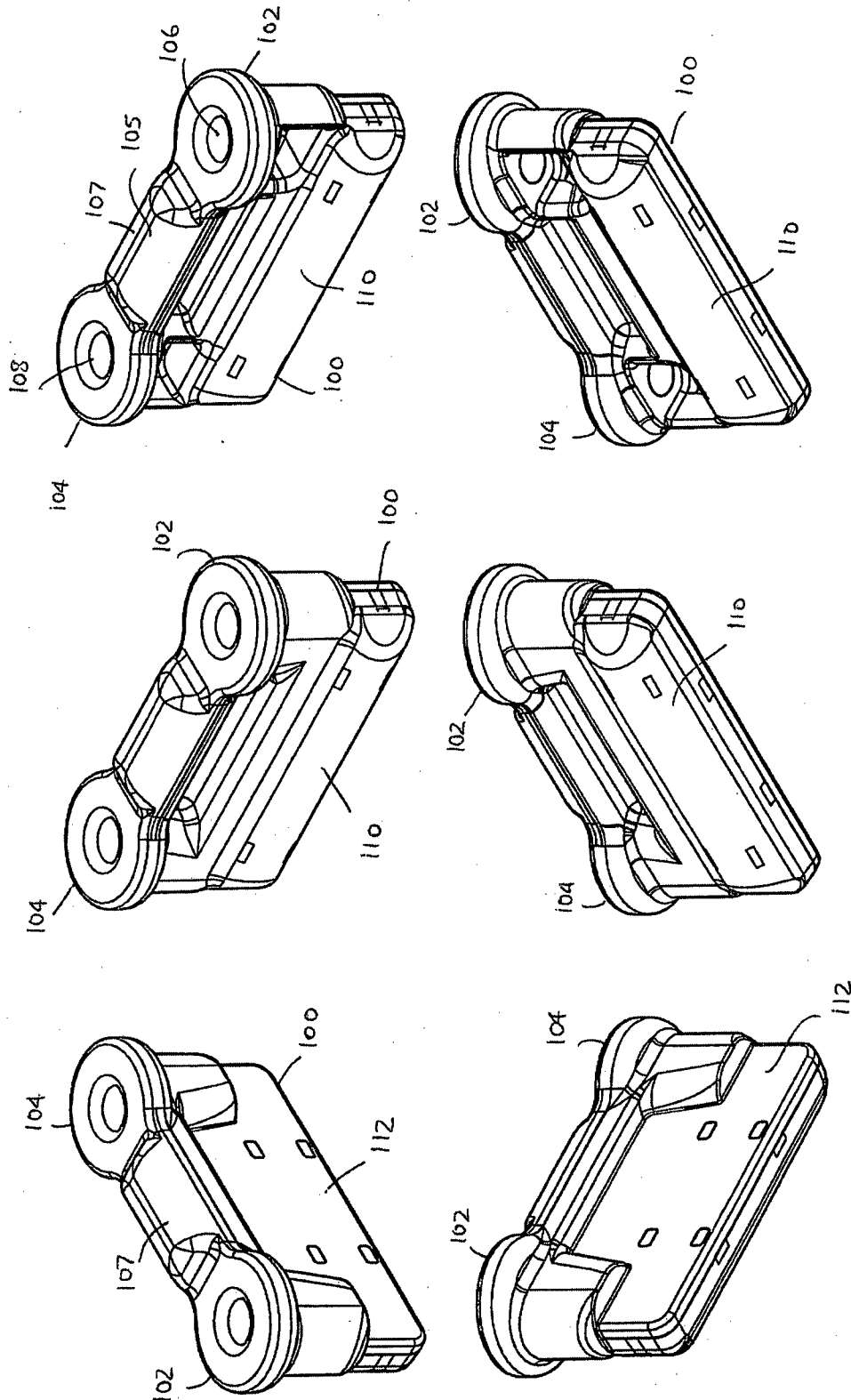
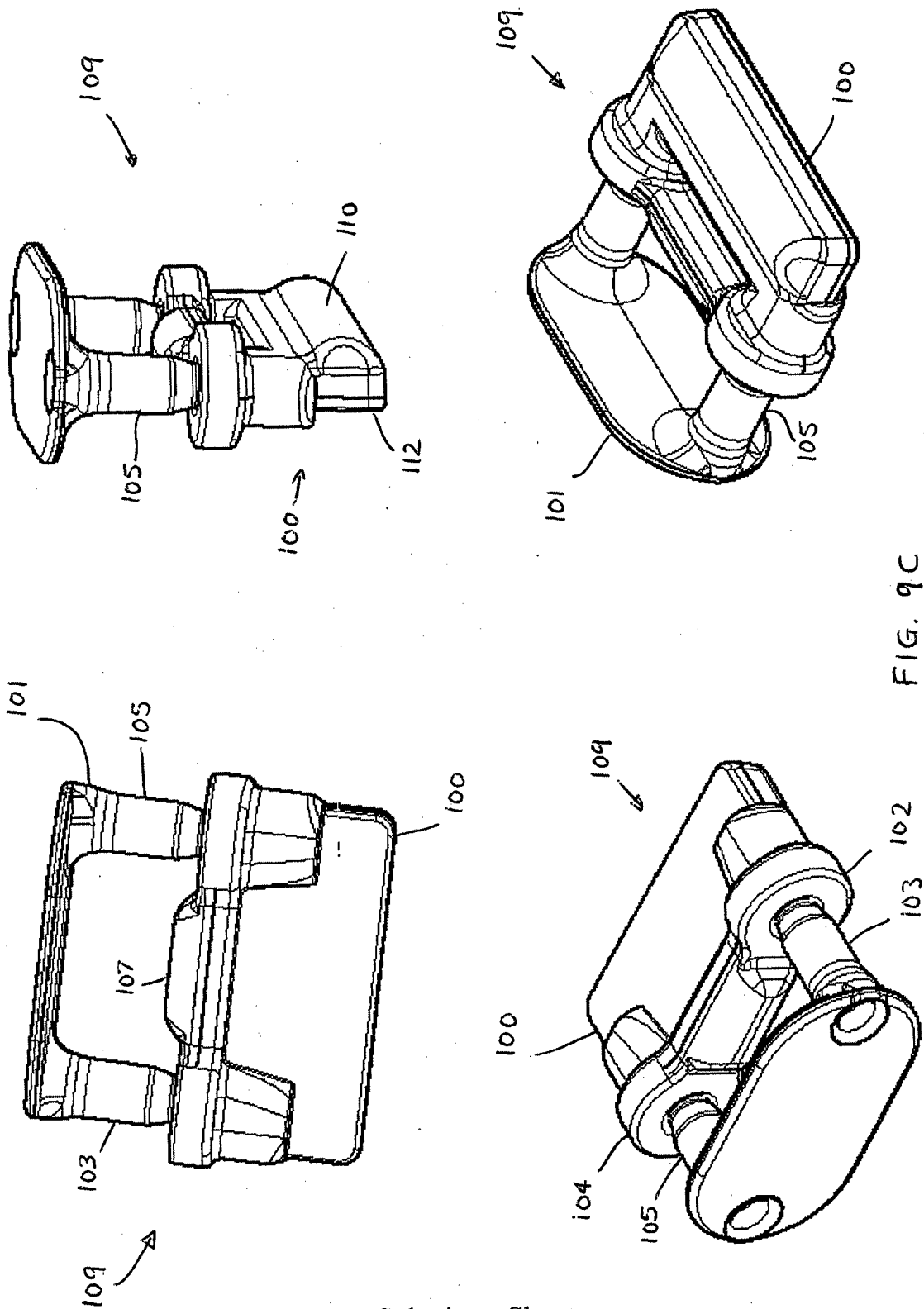


FIG. 9B



INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU2013/000832

A. CLASSIFICATION OF SUBJECT MATTER

A01K 11/00 (2006.01) B29C 45/14 (2006.01) G06K 19/077 (2006.01) G09F 3/00 (2006.01) H04Q 5/22 (2006.01)
G01V 15/00 (2006.01)

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

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

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

1. WPI, EPODOC: IPC, CPC A01K11/00, A01K11/004, A01K11/006, G06K19/077, G09F3/-, H04Q5/22, G01S7/03/LOW, G01S13/-, G01V15/00 and keywords (animal, transponder, case, male, female, mould) and like terms.
2. EPODOC: CPC A01K11/00, A01K11/04, A01K11/006 and keywords (male, female, pair, two, mould) and like terms
3. Google Patents: keywords (animal-tag, transponder, pair, male, female, mould) and like terms

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	Documents are listed in the continuation of Box C	



Further documents are listed in the continuation of Box C



See patent family annex

* Special categories of cited documents:		
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention	
"E" earlier application or patent but published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone	
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art	
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family	
"P" document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search
29 August 2013

Date of mailing of the international search report
29 August 2013

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Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

See Supplemental Box for Details

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.

C (Continuation).

DOCUMENTS CONSIDERED TO BE RELEVANT

PCT/AU2013/000832

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	US 5461807 A (JOHNSON) 31 October 1995 Figures 1-8 Figures 1-8	14 1-13
Y	WO 2004/036984 A1 (STEINFORT, JOHN, JAMES et al.) 06 May 2004 Figures 10, 11	1-9
Y	US 5768813 A (REBOUL et al.) 23 June 1998 Figures 2, 3, 9, 10; column 2 line 61-column 3, line 16; column 2- lines 56-60; column 5, lines 1-6	3-5, 7, 9, 10-13
A	WO 2009/034058 A2 (ALLFLEX EUROPE SAS) 19 March 2009 Figures 1-5, Page 3, lines 19-20 (machine translated page 2- lines 12-13)	1-9, 14
A	EP 2465344 A1 (VAN AKEN INVENT B.V.) 20 June 2012 Whole document	1-9, 14

Supplemental Box**Continuation of: Box III**

This International Application does not comply with the requirements of unity of invention because it does not relate to one invention or to a group of inventions so linked as to form a single general inventive concept.

This International Searching Authority has found that there are two different inventions as follows:

1. Claims 1-4, 6, 8 are directed to a tag and claim 14 is directed to a cartridge forming part of an animal tag. It is considered that the feature "*wherein the cartridge and transponder casing are encapsulated within said tag to prevent dislodgment or damage to the transponder*" comprises a first distinguishing feature.
2. Claims 10-13, 5, 7, 9 are directed to a method of forming an animal tag component encapsulating a transponder casing, including the steps of: positioning and securing a transponder casing that houses the transponder in cartridge; "*securing the cartridge in a mould; injecting/enabling liquid material to flow in the mould to completely enclose the cartridge and the transponder casing; setting the material to form the animal tag component*". It is considered that the feature in italics within inverted commas comprises a second distinguishing feature.

Where appended claims introduce features of one or more of the claimed inventions and yet are appended to claims directed to any other of the claimed inventions, such claims will only be searched and reported on to the extent that additional search fees have been paid for the other claimed inventions. This applies to claims 5, 7 and 9.

The considerations under PCT as to whether there is more than one invention claimed are the same as for lack of unity under Rule 13 of the PCT Regulations. PCT Rule 13.2 permits the inclusion of, in addition to an independent claim for a given product, an independent claim for a method/process specifically designed/adapted for the manufacture of said product. A process/method is specifically adapted for the manufacture of the product if it inherently results in the product.

In the above groups of claims, it is considered that the essence of the invention primarily lies in "A tag encapsulating a cartridge housing a transponder casing." The method (a process of injection moulding) is not specifically designed for the production of the tag. Therefore, the claims do not satisfy the requirement of unity of invention *a priori*.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/AU2013/000832

This Annex lists known patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document/s Cited in Search Report		Patent Family Member/s	
Publication Number	Publication Date	Publication Number	Publication Date
US 5461807 A	31 Oct 1995	None	
WO 2004/036984 A1	06 May 2004	AU 2003265730 B2	07 May 2009
		BR 0315518 A	23 Aug 2005
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		US 7690141 B2	06 Apr 2010
		WO 2004036984 A1	06 May 2004
US 5768813 A	23 Jun 1998	AU 671635 B2	05 Sep 1996
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		CA 2135476 A1	25 Nov 1993
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		HU T69269 A	28 Sep 1995
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		PL 173903 B1	29 May 1998
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		FR 2920948 B1	18 Jun 2010
		WO 2009034058 A2	19 Mar 2009
EP 2465344 A1	20 Jun 2012	WO 2012080498 A1	21 Jun 2012

End of Annex

Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.

Form PCT/ISA/210 (Family Annex)(July 2009)