

12

**EUROPEAN PATENT APPLICATION**

21 Application number: 90304857.7

51 Int. Cl.<sup>5</sup>: **E01F 9/08, E01C 23/16**

22 Date of filing: 04.05.90

30 Priority: 06.05.89 GB 8910454

71 Applicant: **MONE BROS. ROADMARKINGS LIMITED**  
**Albert Road**  
**Morley, Leeds LS27 8RU(GB)**

43 Date of publication of application:  
14.11.90 Bulletin 90/46

72 Inventor: **Pacey, Barry David**  
**8 Fartown Close**  
**Pudsey, Leeds LS28 8NP(GB)**

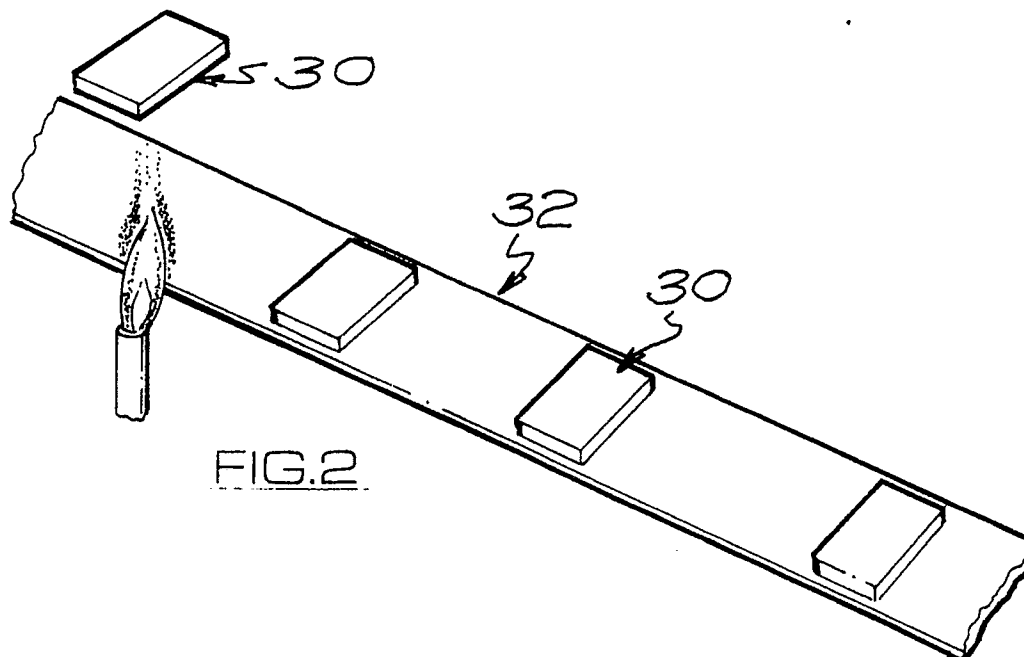
84 Designated Contracting States:  
**AT BE CH DE ES FR GB GR IT LI LU NL SE**

74 Representative: **Denmark, James**  
**c/o Bailey, Walsh & Co. 5 York Place**  
**Leeds LS1 2SD Yorkshire(GB)**

54 **Road marking method.**

57 Preformed pads (30) are applied to traffic lines either by flame heating to softness an existing traffic line (32) followed by pressing the pads, of the same thermoplastic material as the line, onto the softened line, or by applying the pads to a freshly applied line prior to it hardening. The pads are placed by a

machine dispensing same one by one from a magazine, cutting same from a web, or unrolling a pad-carrying web onto the traffic line. The preformed pads are preferably flat and rectangular and, containing retroreflective spheres or provided with reflective strips, are of greater reflectivity than the traffic line.



This invention relates to a method of applying road markings to motorways, trunk roads and the like. Specifically the invention is concerned with the application of so-called "white lines" to roadway surfaces, such white lines being of "ribbed" construction in which the white line comprises a base strip on which are provided spaced pads which provides the ribbing effect. The lines are usually white in colour but need not be and the expression "white lines" should be construed accordingly.

The purpose of such ribbed white lines is to provide a surface which will give a vibratory warning to a motorist whose wheels ride on the ribbed white line on the one hand, and on the other hand the pads on the ribbed white lines will generally speaking lie above surface water which remains on the road surface in wet conditions, so that such projecting surfaces of the pads will be more clearly visible, especially when the material used for the pads is retro reflective, which is the common practice and/or the pads are provided with reflective strips.

At present, ribbed white lines are applied to road surfaces by means of a complicated and expensive vehicle which is equipped to lay down the base strip on the road surface as the vehicle travels on the surface, and immediately behind the application of the strip are applied portions of the same material as is used for the strip. During application, the strip and said portions are in heated molten form, so that the portions fuse to the strip and become integral therewith when the applied material cools and hardens. The material is basically a synthetic plastics material which is thermoplastic in nature and may include aggregate to render it hard wearing, and titanium dioxide for providing the white colouring. Additionally, the material may include ballatine spheres in order to make the resulting ribbed white line retro reflective.

The equipment for applying ribbed white lines involves a hopper for the material, and heating means for heating the material to a molten condition. The material is discharged from the hopper into an outlet which splits into two sub-outlets, the first of which provides a means for discharging material onto the road surface to form the base strip, and the second of which leads to a gating or shutter mechanism which opens and closes and applies the portions of material to the previously applied strip to form the spaced pads on the base strip.

Because the material is supplied from the same hopper to two separate outlets, the reflective characteristics of the base strip and the pads are identical, and indeed it has been found that unless substantially higher quantities of ballatine spheres than normal are used, sufficiently high reflective characteristics of the base strip and the pads are

not achieved, and in wet conditions the projecting pads are indeed not sufficiently reflective.

Additionally, if there is any failure in the operation of any part of the complicated application machine, then it is difficult to continue the road marking operation within a relatively short time unless a replacement machine is available.

The present invention aims at applying ribbed white lines to roadway surfaces in a different and novel manner which overcomes a number of the disadvantages of the known method described above.

In accordance with the invention, ribbed marking lines are provided on roadway surfaces by the application of preformed pads to a previously applied base strip.

Preferably the pads are applied by heating the base strip material for example by means of a blow torch or the like to soften same, followed by the pressing of the pads in spaced relationship to the molten material of the heated base strip.

Although the pads can be applied by hand, it is preferable that they be applied by appropriate machinery.

In one embodiment, the pads are carried by a carrier web or strip which is wound into roll form, and the roll is mounted on the machine so as to be unrolled onto the strip on the road surface progressively, for the progressive application of the pads to said strip.

By using the invention, the pads may be applied to the strip some considerable time after the strip has been applied to the road surface, and indeed the pads may be applied to existing white lines which are in the form of flat strips or in the alternative, the invention may be applied when the base strip is being applied to the road surface, and before the strip has been allowed to cool and solidify.

The pads preferably will be of the same material as the road strip, namely the thermoplastic material conventionally used for road markings, except that it will be possible as the pads are factory manufactured, to embody within the pads a greater quantity of ballatine spheres to ensure that the pads are more retro reflective than the base strip. Alternatively or additionally, reflective material can be stuck onto the pad for higher visibility requirements.

In another aspect of the present invention, a ribbed white line on a road surface may be provided wherein the pads contain substantially more retro reflective spheres than the base strip with which the pads are integrally connected. In this alternative aspect of the invention, it is not necessary that the pads be factory preformed.

Reverting to the main aspect of the invention however, the pads may be cut from a length of

performed strip preferably under factory conditions, but alternatively they may be cut from the preformed strip at the site of application of the pads to the roadway surface.

In a specific construction, the pads may be held between two tapes of plastics film material, which can serve as a carrier for the pads to enable same to be transported to the application site, and which may be removed by appropriate machinery at the site. For example, if the pads are held in spaced condition between two plastic film tapes and the entire assembly is wound into a roll, at the site, the roll may be unwound and one of the tapes removed, leaving the pads connected to the other tape which can be used as a carrier for the application of the pads to the previously applied white line on the roadway surface.

It is also envisaged that the pads may be packaged in bundles, and may be loaded into a machine magazine for the application of same to the roadway base strip, which machine softens the base strip and selects and applies the pads individually.

In another construction, the pads may be again held in a carrier tape but may be fed into a machine which removes the pads individually, and applies same individually to the existing white line on the roadway surface.

Where, in the preferred case, the existing white line requires to be heated to soften the material of the line, such heating will take place immediately prior to the application of the pads.

The invention can be used in connection with any method for application of the base line. For example the base line may be applied by conventional methods such as spraying, extruding, or by manual screeding.

The machine for applying the pads may be relatively simple in construction, because it is not required to handle molten material. If necessary, there may be provided a machine for heating an existing white line for the application of the pads, but again such machine can be relatively simple in construction.

The invention does provide in its various aspects an effective method for providing a ribbed white line on a roadway surface, and also a ribbed white line in which the pads forming the ribbing can be of greater retro reflectivity than the base strip on which the pads are laid.

The invention also provides a roadway marking line comprising a base strip with pads applied thereto in accordance with the method as aforesaid.

By way of further explanation of the invention, further details are supplied in the following explanation which refers to the accompanying drawings, in which:-

Fig. 1 shows the prior art method used for applying the ribbed white lines to roadway surfaces;

Fig. 2 shows a preferred method according to the present invention; and

Fig. 3 shows a band of pads which are preformed and which are usable in the method shown in Fig. 2.

Referring to the drawings, in the prior art method shown in Fig. 1, a ribbed white line 10 is applied to a roadway surface by pouring molten roadway surface material from a first shutter controlled outlet 12 in the form of a ribbon 14. That ribbon 14 forms a base strip for the ribbed white line, and sections of the same molten material are applied from a pair of shutter controlled outlets 18, 20 so as to form spaced pads 22 on the base strip 14. The pads 22 are applied to the base strip 14 whilst it is still warm and fluent, but eventually the strip and the pads 22 harden and solidify. The material which is used for the strip and pads is the conventionally used material which is thermoplastic in nature and is referred to as British Standard Material BS3262. It includes titanium dioxide so that it is white in colour, and it also includes aggregate to improve its abrasion resistance and ballatine spheres in order that it will be retro reflective.

The pads 22 are delivered from the outlets 18 and 20 in that the machine which delivers the sections to form pads 22 includes a shutter mechanism in the casing 24. The shutter mechanism is not shown but it operates to deliver discrete portions of the material to form the pads 22. The entire apparatus advances in the direction indicated by arrow 26 during the laying of the white line so that the white line can be laid continuously. The machine is provided with a large hopper or reservoir containing the material and the reservoir is continuously heated to maintain the material in a molten state. The material is discharged from the reservoir to the respective outlets 12, 18 and 20. The laying of ribbed white lines as illustrated in Fig. 1 is expensive. The lines cost in the order of £1.60 per metre, whereas the laying of the more widely used flat strip 14 costs in the region of 30p per metre.

The present invention seeks to provide a simplified and improved method of laying ribbed white lines on roadway surfaces, and one embodiment is illustrated in Fig. 2. The principle of the invention is that preformed pads 30 to replace the pads 22 in the Fig. 1 embodiment are provided, and these pads are subsequently applied to a base strip 32 which will normally be previously applied to the road surface, for example by the method described in relation to Fig. 1 by using an outlet 12, or by extrusion or by spraying or by application to provide a coarse screed which involves using a man-

ually propelled wheelbarrow having an outlet for the material which forms the strip 32.

The pads 30 are applied to the strip 32 as indicated in Fig. 2 by softening the surface of the strip 32 and then by simply pressing the pads 30 thereto. The pads and strip will be of the same material which is also as used in the conventional method, except that the pads 30 as they are factory preformed can embody a greater quantity of ballatine spheres and therefore they will be more retro reflective than the strip 32. They can also be provided, under factory conditions, with reflective strips.

The pads 30 may be produced for handling in any convenient manner, but although in Fig. 2 a simplified embodiment of how the pads are applied to the strip 32 is shown, in practise the pads may be applied by appropriate application machinery. That application machinery may embody a flame torch for the preheating of the strip 32, or the flame torch may be embodied in a separate machine which precedes the machine for applying the pads 30. Indeed, the pads can be applied immediately after the application of the molten material to the road surface.

Fig. 3 shows how the pads may be held by carrier tapes 34 and 36 which may be bands of transparent film with the pads 30 sandwiched therebetween and in spaced relationship as shown. Such a construction may be wound into roll form, and the roll is unwound as the pads progressively and by machinery are applied to the strip 32. The machinery may be adapted initially to remove one of the tapes 34 leaving the other tape to serve as a carrier for the placement of the pads on the strip 32. Other application methods as described hereinbefore can also be adopted.

As an alternative to the Fig. 3 arrangement, the pads 30 may be formed as individual components and stacked in groups for placement in a magazine from which they are individually selected and individually applied to the strip 32.

The pads 30 are essentially pressed to the strip 32 whilst it is in the molten condition or has been made molten for the application of heat.

Although the invention is not intended to be limited to any specific dimensions for the strip and pads, the standard details for ribbed white lines are that the strip width should either be 150 mm or 200 mm, and the spacing between the pads should either be 500 mm or 250 mm. The pads should be single elongate members of a minimum of 80% of the strip width and each pad should be of a width between 40 and 50 mm. Obviously these dimensions will be particularly relevant to the ribbed white lines to be produced in accordance with the invention but the invention is not to be considered as being limited thereto.

## Claims

1. A method of providing ribbed marking lines on a roadway surface wherein preformed pads are applied to a previously applied base strip.

2. A method according to Claim 1, wherein the pads are applied by heating the base strip, followed by pressing of the pads in spaced relationship to the heated material.

3. A method according to Claim 2, wherein the heating of the base strip is effected by means of a gas burner.

4. A method according to Claim 3, wherein the gas burner is carried by an apparatus which is moved along the direction of the strip.

5. A method according to any preceding claim, wherein the preformed pads are applied by a machine which is moved along the direction of the strip.

6. A method according to Claim 5, wherein the pads are placed in a magazine of the machine and are removed therefrom one by one as the machine applies the pads to the base strip.

7. A method according to any of Claims 1 to 5, wherein the pads are carried by a carrier web, which is wound into roll form, and the roll is unrolled progressively onto the strip for the progressive application of the pads to said strip.

8. A method according to Claim 1, wherein the strip is applied in the form of a fluent solidifiable material and the pads are applied before the strip has solidified.

9. A method according to Claim 1, 2, 3, 4, 5 or 8, wherein the pads are cut from a web of the pad material immediately before being applied to the base strip.

10. A method according to any one of the preceding claims wherein the pads are of the same material as the strip which material is thermo plastics in nature.

11. A method according to any preceding claim wherein the pads are or are rendered more reflective than the strip.

12. A method according to Claim 11, wherein the pads contain retro-reflective spheres.

13. A method according to Claim 11 or 12, wherein the pads have reflective strips applied thereto.

14. A method according to any preceding claims, wherein the pads are flat and rectilinear in shape.

15. A roadway marking comprising a base strip and pads applied by the method according to any one of the preceding claims.

16. A ribbed roadway marking wherein the pads on the strip are reflective to a greater extent than the base strip in which they are carried.

17. A roadway marking according to Claim 16,

wherein the pads are of thermo plastics material containing retro reflective elements to a greater degree than the base strip.

18. A roadway marking according to Claim 17, wherein the retro reflective elements comprise retro reflective spheres. 5

19. A method of providing a ribbed roadway marking substantially as hereinbefore described with reference to the accompanying drawings. 10

15

20

25

30

35

40

45

50

55

5

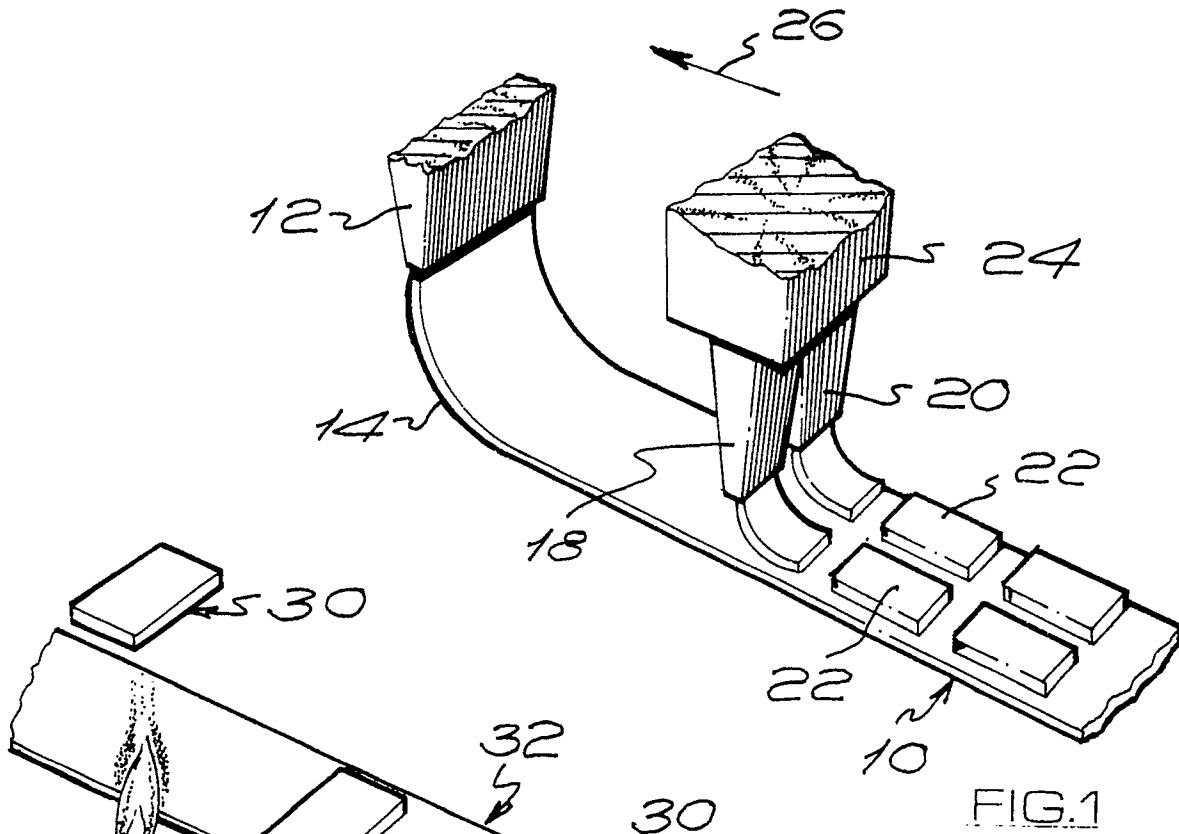


FIG. 1

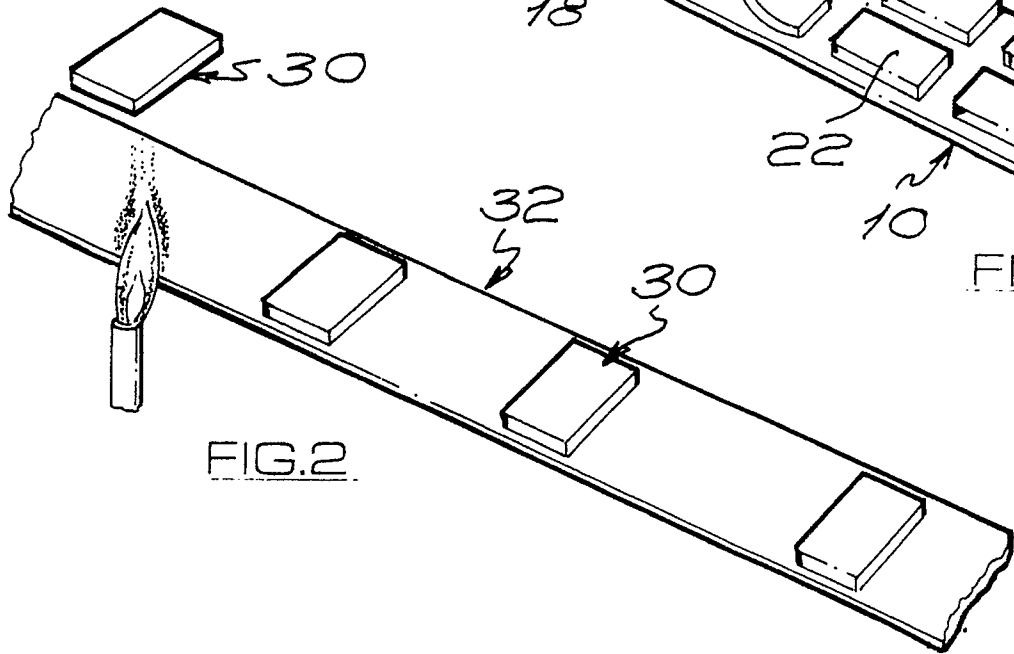


FIG. 2

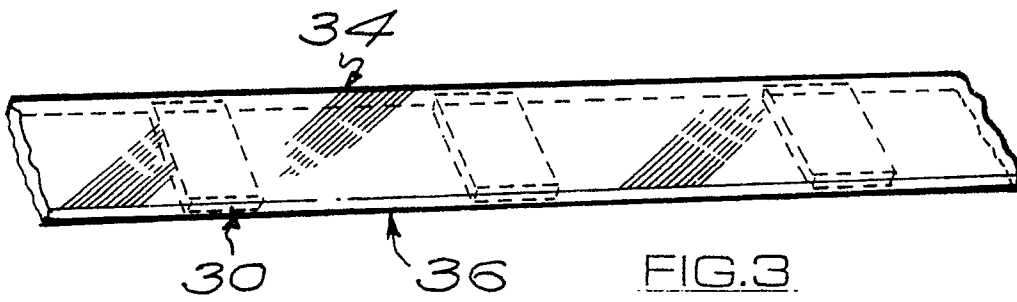


FIG. 3



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.5)
X	GB-A- 688 310 (R.S. CLARE & CO.) * Page 1, lines 19-24,35-63; page 2, lines 36-48,51-56 *	1,2,8, 10-12, 15-18	E 01 F 9/08 E 01 C 23/16
Y	---	3-6,9, 14	
Y	FR-A-1 122 259 (PRISMO SAFETY CORP.) * Page 1, left-hand column, lines 1,2; right-hand column, lines 25-38; page 2, right-hand column, lines 35,36,39-43; page 4, right-hand column, lines 9-23,25-29 *	3,4	
A	---	1,2	
A	DE-A-1 459 709 (GUBELA) * Page 1, lines 1-3; page 1, line 14 - page 2, line 6 *	3,4	
X	EP-A-0 102 585 (EIGENMANN) * Page 3, lines 2-9,12-14; page 4, lines 15-20; page 4, line 26 - page 5, lines 6-8,10,11,14-17,23,24,27-29; page 8, lines 16-21,24-32; page 10, lines 12-16,21-26,30-33; page 11, lines 1,4-8,17-20,23,29,30; page 12, lines 4-6,10-13; page 14, lines 15-17,19-23; page 15, lines 4-6; figures 1',1'',2a,4,5,7 *	1,8,11, 12,15, 16	TECHNICAL FIELDS SEARCHED (Int. Cl.5)  E 01 F E 01 C
Y	---	5,6,9 10,17, 18	
A	---	-/-	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 06-08-1990	Examiner SCHUMAN R.
<p><b>CATEGORY OF CITED DOCUMENTS</b></p> <p>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</p> <p>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  .....  &amp; : member of the same patent family, corresponding document</p>			



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.5)	
X	GB-A-1 201 548 (PRISMO SAFETY CORP.) * Page 1, lines 10-12,17-20,35-44; page 2, lines 14-20,38-41,48-52,57,58,60,61; page 3, lines 10,11,27,28; page 5, lines 24-26,29-32; figures 2,5,6 *	1,8,10-12,15-18		
Y A	GB-A-1 201 548 ---	14 5		
X A	NL-A-7 907 550 (HASCO LAKFABRIEKEN) * Page 1, lines 1-4,24-28; page 2, lines 1-3,6-14,27-29,33-36; page 3, lines 4,9,12,15-25; page 4, lines 2,9-17 *	1,8,10,14-16  2,9,11,12,17,18		
X Y	EP-A-0 226 831 (EIGENMANN) * Page 2, lines 1-4,16,17,31-37,41; page 3, lines 1-3,6,7; figure *	1,5,11,15,16  7		TECHNICAL FIELDS SEARCHED (Int. Cl.5)
Y	DE-U-8 310 200 (SILBERNAGEL) * Page 2, lines 1,2,9-17; page 3, lines 17-28; page 4, lines 6-11,18-20,24-26,30-33; page 5, lines 1-15,19-21; figures 1,2 *	7		
	--- -/-			
The present search report has been drawn up for all claims				
Place of search THE HAGUE		Date of completion of the search 06-08-1990	Examiner SCHUMAN R.	
CATEGORY OF CITED DOCUMENTS		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		
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				





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.5)
A	FR-A-1 127 962 (MANUFACTURES DE CAOUTCHOUC INDUSTRIEL P. LACOLLONGE) * Page 1, left-hand column, lines 13,14,35-39; right-hand column, lines 13-16,36-40; page 2, left-hand column, lines 1-6,14-18,21-30 *	5,7	TECHNICAL FIELDS SEARCHED (Int. Cl.5)
X	NL-A-7 208 316 (J. BRAND N.V., changed to FABRAN-HOLDING) * Page 1, lines 1-3; page 5, lines 4-12,15-31 *	1,5,6,8,15	
A	DE-A-2 518 471 (EVODE LTD) * Page 1, lines 3-5; page 2, lines 25-30; page 3, lines 7-20 *	1-4	
A	GB-A-2 053 330 (HARKER et al.) * Page 1, lines 12-17,39-47; page 2, lines 37-48,71-76; figure 1 *	1-5,8	
A	AT-B- 307 282 (EIGENMANN) * Page 2, lines 1-4; page 3, lines 9,10,24-27,31,32; page 4, lines 21-23; page 5, lines 1-4; page 10, lines 2,3; figures 1,2 *	10-12,16-18	
X	EP-A-0 279 204 (MINNESOTA MINING AND MANUFACTURING CO.) * Column 2, lines 29-34,52-54; column 3, lines 5-8; column 4, lines 36-44; column 6, lines 41-45 *	1,11,13,15	
A	CH-A- 519 628 (WIPFLER) * Column 1, lines 1-3; column 2, lines 16-25,30-32,40-42; column 3, lines 17-27,30-37; column 4, lines 5-8,57,58; figure 1 *	13,14	
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 06-08-1990	Examiner SCHUMAN R.
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			