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(54) ROAD MARKING METHOD - THE APPLICATION OF RIB PADS

Strassenmarkierungsverfahren, Aufbringen von Markierungselementen

METHODE DE MARQUAGE DES ROUTES PAR APPLICATION DE PLAQUETTES A NERVURES

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(56) References cited:

EP-A- 0 102 585	EP-A- 0 279 205
EP-A- 0 397 406	DE-A- 1 923 877
FR-A- 2 295 435	GB-A- 1 201 548
US-A- 4 136 991	US-A- 4 888 896
US-A- 4 974 990	

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Description

[0001] 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 rib pads to a road surface, such that the rib pads protrude above the road surface and are applied at spaced intervals along a road. The application of the said pads is performed by mechanical means such that the application can be accurately performed.

[0002] The purpose of such rib pads is, in combination, to cause a vibratory effect on a vehicle upon the vehicle wheels passing over the said rib pads. The rib pads protrude above the road surface and as such, in general terms, shall be evident above road surface water.

[0003] At present rib pads are applied to the road surface by means of a complicated and expensive vehicle which is required to lay down fluent and molten material to form a base strip on the surface as the vehicle travels along the surface with the rib pad itself being formed of a similar material to that of the base strip. During the application, the strip pads are formed by a mechanical shutter mechanism which allows a blob of material to form on the strip. In this form the equipment for the application of the rib comprises a hopper for the material and a heating means. The molten material is applied to the road surface in the form of a base strip and a series of blobs.

[0004] As a result of the formation of the ribs from the same material as the base strip and the simultaneous application of the base strip and the ribs, the machinery so described has the disadvantage of requiring the rib application to be performed at the same time as the base strip is laid. This has the effect of slowing down the application process when the time allowed for the process is frequently limited by traffic flow constraints i.e in the form of limitation of traffic congestion. Furthermore, if failure occurs in the operation of any part of the application machine, then it is difficult to continue the road marking operation until a replacement machine is available.

[0005] In addition the simultaneous application of base strip and ribs requires that the consistency of the material forming the strip and ribs be the same. This is wasteful as the composition of the ribs is normally required to be harder wearing than that of the base strip as it is the rib pads with which vehicle wheels are most in contact. Furthermore, the vibration effect of a rumble strip is best achieved when the sides of the ribs are vertical. The present method is unable to achieve this as the hot material slumps causing the ribs to lose their definition.

[0006] The document EPA 0397406 discloses the application of rib pads to a pre-applied line by heating the same with a blow torch or to have the line in a molten condition having just been applied. This patent however teaches that the rib pads must be kept in a rigid condition

to allow the same to be bonded to a line of paint in a molten condition.

[0007] The present invention aims to provide the application of rib pads to a surface to form a rumble strip or demarcation strip wherein the pads are applied to a base strip when in a molten state or with at least a molten layer so that said pad molten layer can take into account any irregularities in the surface to which the same is to be applied and to perform said application by automated apparatus comprising placing and securing operations for the application of each rib pad. This allows the rib pads to be produced so that they need not be manufactured from the same material as is the base strip and said rib pads need not be manufactured simultaneously with the base strip.

[0008] According to the present invention there is provided apparatus for making a rumble strip or demarcation line of a type having a plurality of protrusions at spaced intervals on a road surface, comprising a movable rib pad laying unit for moving at predeterminable speeds along the road surface; integrated rib pad laying equipment for laying the preformed rib pads, said integrated rib pad laying equipment including a magazine for holding a plurality of said preformed rib pads; means for removing at selected time intervals a pad from the magazine; means for placing said preformed rib pads onto the road surface and characterised in that dedicated heating means are provided and directed to heat the rib pads so that when the rib pads are in position on the line of paint or road surface the underside thereof have a layer of softened material formed from the material of the rib pad to bond with the road surface or pre-applied line of paint.

[0009] By heating the rib pad to form the molten layer, so the teachings of the prior art document are clearly contradicted and furthermore, the apparatus allows for the automated heating and laying of said rib pads.

[0010] There is provided a means for forming a rumble strip on a road surface wherein said rumble strip comprises a base line of paint of thermoplastic and a series of raised protrusions, each of said protrusions being provided by the application of a rib pad to the base line.

[0011] In one embodiment, the base line will be previously applied and can be heated to a molten state prior to the rib pads being applied thereto.

[0012] Typically, upon application the rib pads are secured by pressing the rib pad into the molten surface by a further operation.

[0013] Preferably the operation so described will be performed from one rib pad laying unit.

[0014] The said rib pads can be stored on the rib pad laying road unit by means of a magazine mounted thereon such that the rib pad to be laid is removed from the bottom thereof.

[0015] In a further embodiment the pads can be preformed on the rib pad laying road unit from, in one embodiment, a roll mounted on the said rib pad laying road

unit wherein the rib pads to be laid are punched out therefrom prior to being laid by the placing mechanism.

[0016] The operations of heating, placing and securing of the rib pads so described can be performed by the rib pad laying road unit in sequence such that the direction and speed of movement of the unit shall be continuous.

[0017] In the invention, the rib pad laying road unit is capable of applying the rib pads at regular spaced intervals and said spaced intervals are adjustable to suit the required spacing intervals.

[0018] Typically the rib pad laying road unit is capable of applying pads of varying dimensions to the required surface.

[0019] In one embodiment the apparatus for the application of the pads can heat the surface to which the rib pads are to be applied, by applying heat produced from gas burners mounted in close proximity to the said surface, to a state of fluidity sufficient to accept therein the rib pads.

[0020] The rib pad securing operation of the pad laying unit can be performed by either a wheel which, upon passing over the pad, serves to press the pad into position. In another embodiment, particularly suited for when the pads may lie at an angle after placing, the wheel is replaced by a heating head which heats the pad sufficiently so that it will, in effect, form as one with the molten base surface.

[0021] In a further aspect of the invention there is provided a method of forming a rumble strip or demarcation line on a road surface or pre-applied line of paint, the method comprising the steps of moving a rib pad laying unit along the surface of the road; depositing a plurality of rib pads along said surface of the road or pre-applied line of paint; controlling the distance between sequentially deposited rib pads and characterised by applying heat to said deposited rib pads to form a bonding layer of softened material of the rib pad so that the said bonding layer bonds with the road surface or pre-applied line of paint.

[0022] As an alternative to the powered road unit the rib pads can be laid by the means of a manually controlled rib pad laying unit wherein the said unit is manually controlled by an operator and the laying operations are controlled by means of mechanical actuation, as the said unit is moved along the surface.

[0023] In one embodiment said rib pads are applied immediately after the said base strip laying operation. Said molten base strip can be applied from the rib pad laying road unit.

[0024] In a further embodiment of the invention the rib pads are applied to a road surface to form a demarcation line wherein said rib pad is applied to a blob of material such as molten plastic in a molten state applied to the road surface prior to the application of the rib pads.

[0025] Preferably said rib pads are applied to the blobs of material and said rib pads and blobs of material are oversprayed or painted with a substantially contin-

uous line of material to form a rumble strip.

[0026] Typically the application of said continuous line will be followed by the spraying thereon of reflective beads which, when part of the line, render the line reflective.

[0027] In one embodiment said rib pads, after application, can be oversprayed with paint to form a rumble strip.

[0028] In one embodiment of the invention said rib pads are manufactured from plastics material remote from the laying of the rib pads.

[0029] In one embodiment the rib pad is formed of thermoplastics material with a reflective top surface provided by light reflective spheres embedded in the plastics.

[0030] Preferably there is incorporated into the said manufacturing process the capability to apply reflective beads to the rib pads such that the reflective quality of the rib pads is enhanced. Preferably the said beads are applied to the rib pads by the means of a spray of the said beads.

[0031] The pads may be further reflectorised by the attachment of reflective devices to the rib pads and preferably along the longitudinal edges of same. Typically said rib pads will have reflective strips attached to the vertical edges of said strips.

[0032] Thermoplastic material of varied colours may be used in the manufacture of the said rib pads to suit the statutory road marking colours required and the rib pad dimensions will be such that they can be laid on the base strip by the rib pad laying apparatus so described.

[0033] Preferably the rib pads manufactured are of 4.5cm width and either 20cm, 15cm or 10cm in length.

[0034] In one embodiment the rib pads can be manufactured by the extrusion of lengths of thermoplastic material, the said lengths being subsequently cut to form the said rib pads of required dimension. As an alternative to cutting the said lengths of thermoplastic material, it will be possible to control the flow of the extrusion of the thermoplastic material such that the material can be extruded in controlled lengths. This embodiment will provide means whereby a shutter mechanism will control the length of the rib pad to be produced by controlling the length of each extruded part to match. Preferably the extruded material shall be laid in a molten state onto polypropylene film to protect the conveying system from damage, and the extruded material shall be cooled as quickly as possible from the molten form by means of a blast freezer or by the treating of said material with water.

[0035] The method of using rib pads with a soft bonding layer on the underside of the rib pads compensates for irregularities in the road surface to which rib pads are to be applied.

[0036] The use of rib pads with a soft bonding layer applied to the road surface to compensate for irregularities in the road surface, is also possible.

[0037] In another feature of the invention the bonding

on the underside of the rib pads shall be provided by the application of extra bonding to the underside of said rib pads.

[0038] In a further embodiment there is provided the application of base material to the road surface prior to application of rib pads to fill in any pot holes or irregularities which may exist in the road surface.

[0039] Furthermore in another feature the application of rib pads to the road surface is followed by the laying thereon of a line and thirdly the spraying thereon of beads.

[0040] Embodiments of the present invention will now be described, by way of example, with reference to the accompanying drawings, wherein:-

Figure 1 is a plan view of one embodiment of a rib pad laying road unit;

Figure 2 is a rear end elevation of the road unit shown in Figure 1;

Figure 3 shows a perspective view of the rib pad depositing assembly and the rib pad roller;

Figure 4 is a plan of the central column of the rib pad depositing assembly shown in Figure 3;

Figure 5 shows another embodiment of a rib pad depositing assembly;

Figure 6 shows a rib pad laying unit of a further embodiment.

[0041] With reference to the drawings and in the first instance to Figures 1 and 2 there is shown a road unit 2 from which the rib pad laying operation is performed. The unit 2 is a four wheel vehicle having four wheels 4 and comprising a driver seating area 6, a fuel tank 8, gas canisters storage area 10, a tool box 12, work table 14, work platform 16 and a rib pad storage area 18. On one 22 of the edges 20 and 22 running longitudinally of the road unit 2 there is mounted the rib pad laying equipment 24.

[0042] The rib pad laying equipment 24 comprises a burner section 26 which consists of a series of gas burners 28. A depositing assembly 32 is mounted behind the burner section 26 in relation to the direction of travel 30 of the road unit 2 and is followed by a presser roller 34 for applied rib pads.

[0043] To increase the visibility and safety of the road unit 2 the rear of the road unit 2 is equipped with flasher lights 36 and has the capability of having hazard signs 38 fitted thereon.

[0044] The depositing assembly 32 is shown in greater detail in Figures 3 and 4 and comprises a central column 42 in which the rib pads 40 are contained. Column 42 formed of two U-sectioned bars 44 and 46. To accommodate different sized rib pads 40 spacers 48 (as shown

in Fig 4) can be placed inside the column along with the said pads when loading the central column 42. At the bottom 50 of the central column 42 a slot 52 therein allows one rib pad 40 at a time to be pushed by a mechanism 54 in the direction 56 onto a spring flap 58 held normally in a horizontal position by spring 60.

[0045] In the order to lay the rib pads 40 the unit 2 is driven at a speed, approximately 1 mile (1.6 km) per hour, and on a path such that the rib pad laying equipment 24 is positioned above that line on road on which the rib pads 40 are to be laid. With the road unit 2 driven in the direction 30 shown, the burner section 26 supplied by gas from tanks 10 serves to melt the road surface immediately below the burners so that the surface melts which allows the rib pad 40 subsequently to be pressed therein. The rib pads are deposited by depositing assembly 32. Each rib pad is deposited by means of the pad having been pushed by mechanism 54 to reach a position 62 on the spring flap 58 and the holding force of the spring 60 is overcome by the returning action of the mechanism 54 which is connected to the said flap. This causes the flap to lower into the position shown by the broken lines 64 and allows the rib pad 40 to slide into position on the molten surface. The frequency of depositing the rib pads 40 on the surface is dependant on the frequency of reciprocation of the mechanism 54. The reciprocatory movement is controlled by a linkage geared to the engine of the road unit 2. The spacing of the rib pads 40 along the road is dependent upon the speed of the unit 2 and the frequency of reciprocation of the mechanism 54.

[0046] When in position on the surface, each rib pad 40 is pressed into the soft, heated road surface by the pad roller 34. Roller 34 passes over the said pad as the road unit 2 continues in direction 30. Instead of a pressing roller 34, a pressing spider wheel may be used comprising radial arms each with a pressing bar on its extremity. The spider wheel rotates in synchronism with the laying of the pads so that each presser bar in turn comes down onto and presses a previously applied pad.

[0047] The pad laying process of heating, placing and pressing is repeatedly and continuously performed as the said road unit continues in the direction 30, with the depositing assembly 32 being refilled with rib pads 40 when required by an operative on the road unit 2. Instead of the burners 28, column 32 and the presser being on a dedicated machine it may be connected to a conventional vehicle such as a lorry.

[0048] In another embodiment as shown in Fig 5 the depositing assembly 32 consists of the mechanism 54 and the central column 42 as described previously. The spring flap 58 and spring 60 are omitted. The rib pads 40 are held in the central column 42 which as before has a slot 52 formed therein. The central column 32 is mounted at such an angle that the rib pads 40 are held in position so that the bottom rib pad 40 will not leave the central column 42 until pushed by mechanism 54 and when it is so pushed, it falls freely and predictably

to the ground.

[0049] In a further embodiment, the rib pad roller 34 may be removed and replaced by a heater head. In this embodiment once the rib pad 40 has been placed in position by the depositing assembly 32, it is heated by the heater head such that the rib pad melts sufficiently to allow a bond to be formed with the heated surface upon which it is laid. This prevents the pad from cracking due to the pad roller 34 passing over and especially when applied to uneven surfaces.

[0050] Instead of the pads being displaced from the magazine 21 by a reciprocating mechanism, they may be fed to a feed wheel having peripheral notches into which the pads are placed one by one, and as the process proceeds the wheel is rotated and carries the pads round the wheel one by one and presents them to the road surface. This can be used in any embodiment.

[0051] In further embodiments (not shown) the rib pad laying unit will be provided with means whereby a base strip can be laid onto the road surface prior to the rib pad application process. Typically this will involve the removal of the burner section 26 and replacement with a base line point application means.

[0052] Figure 6 illustrates a rib pad laying unit wherein the burner section 26 and the roller 34 have been removed. The roller 34 has been replaced by a bead spraying mechanism 66 thereby illustrating the adaptability of the rib pad laying unit.

[0053] The pads can be further reflectorised by reflective devices such as for example reflective tape or plastic reflectors, being placed, stuck or embedded into the longitudinal edges of the pads. The said reflective devices may be protected by a layer of hard wearing plastic film.

[0054] Coloured thermoplastic material may be used for or with the pad. Thus the pad may be formed wholly of the coloured thermoplastic material or may have a strip of the said material bonded thereto. The coloured edges can thus be placed facing towards the motorist for maximum reflectivity and warning.

[0055] The three operations of heating, placing and securing may be performed by the means of a manually controlled and propelled rib pad laying road unit. Integral to this unit in one embodiment will be a means for heating the base strip and a manually controlled lever application mechanism whereby the rib pad can be laid on the road surface as the road unit is propelled along the road surface. The effect of the said three operations are similar to that provided by the powered road unit. The manually controlled road unit may be especially suited to operations which require increased manoeuvrability or involve only small stretches of rib pad laying.

[0056] The mechanism for dispensing the pads can be attached to existing screed, spray and extruding machinery so that pads can be laid directly on to newly applied base lines whilst the material is still molten, thus alleviating the need for heating up of the base line.

[0057] This unit has the advantage of providing, in one

integral unit, a method of laying the said rib pads wherein the operations of heating, laying and pressing are part of one linked system with a comparatively high degree of automation which ensures that the rib pads 40 are laid in a systematic and efficient manner without the requirement for a simultaneously laid base strip.

[0058] The rib pad laying road unit allows rib pads 40 of varying sizes to be laid independently of the laying of any base strip as is required by existing methods. This will allow the said rib pad laying to be performed more quickly and traffic congestion will be minimised and thus greater flexibility in the planning of a rib pad laying process is provided.

[0059] The safety of the operatives is greatly increased by this rib pad laying unit as it allows the operatives to operate from the vehicle itself which is equipped with hazard signs and affords the said operators a degree of protection against collision with any other vehicle.

[0060] Furthermore, the ability to lay the rib pads to the road surface and then overspray allows the rib pads to be located as an integral part of a rumble strip whilst maintaining the flexibility of the rib pad laying mechanism.

[0061] The ability to provide preformed, reflectorised rib pads, manufactured remote from the point of application to the road surface or base line provides a pad which is adaptable and flexible in use to form a demarcation line or rumble strip.

[0062] The apparatus and method according to the invention in its various embodiments can be used for the creation of rumble strips in various circumstances as follows.

[0063] Firstly, when the line of the road along which the pads are to be provided has no existing white line and none is to be provided before the pads are applied, the pads may be applied by heating and softening the road surface as described followed by application of the pads to the heated surface. The pads will mainly be of the rigid type described, but could be portions of molten material which subsequently hardens. Alternatively the pads may stick to the road surface with adhesive, such as pressure sensitive adhesive on the underside of the pads. After the pads have been applied, a strip of molten white lining material may be applied over the pads so that a rumble strip continuous white line is formed.

[0064] Where the road surface along the line where the rumble strip has to be formed already has a white line, this may be softened by heat and the pads applied to the softened material before it re-hardens. Again, the pads may be rigid components or may be applied as molten portions. Another possibility is that the pads (rigid) can be stuck to the white line using adhesive.

[0065] Where there is no white line, but one is to be provided, this may be applied as described herein by applying the molten material to the road surface to form the strip, followed by the application of the pads (rigid) whilst the strip is still warm and soft.

[0066] Again it is possible to apply a further strip of white lining over the applied pads.

[0067] In all cases where rigid pads are used, they are preferably pressed downwards onto the receiving surface after application.

[0068] Any feature of any rib pad laying apparatus described herein can where appropriate be used in combination with any other feature of that apparatus or any other such apparatus described herein.

Claims

1. Apparatus for making a rumble strip or demarcation line of a type having a plurality of protrusions at spaced intervals on a road surface, comprising a movable rib pad laying unit (2) for moving at predetermined speeds along the road surface; integrated rib pad laying equipment (24) for laying the preformed rib pads (40), said integrated rib pad laying equipment (24) including a magazine (42) for holding a plurality of said preformed rib pads (40); means (32) for removing at selected time intervals a pad (40) from the magazine (42); means (54, 58, 60) for placing said preformed rib pads (40) onto the road surface and characterised in that dedicated heating means are provided and directed to heat the rib pads so that when the rib pads are in position on the line of paint or road surface the underside thereof have a layer of softened material formed from the material of the rib pad to bond with the road surface or pre-applied line of paint.
2. An apparatus according to claim 1 characterised in that heating means (26) are provided to heat the road surface or pre-applied line of paint prior to the application of the rib pad thereon.
3. An apparatus according to claim 1 characterised in that there is further provided a base strip application means for applying a base strip to the road surface prior to the application of rib pads (40).
4. A method of forming a rumble strip or demarcation line on a road surface or pre-applied line of paint, the method comprising the steps of moving a rib pad laying unit (2) along the surface of the road; depositing a plurality of rib pads (40) along said surface of the road or pre-applied line of paint; controlling the distance between sequentially deposited rib pads (40) and characterised by applying heat to the underside of said rib pads (40) to form a bonding layer of softened material of the rib pad so that the said bonding layer bonds with the road surface or pre-applied line of paint.
5. A method according to claim 4 characterised in that the bonding layer of softened material is formed on

the underside of the rib pads which contact with the road surface or line of pre-applied line of paint.

6. A method according to claim 5 characterised in that prior to performing said step of depositing the rib pads there is provided the further step of loading a plurality of previously manufactured rib pads (40) onto a magazine (42) in said rib pad laying unit.
7. A method according to claim 4 characterised in that the road surface or pre-applied line of paint is heated by heating means (26) prior to the application of the rib pads thereto.

Patentansprüche

1. Vorrichtung zur Herstellung eines/einer Markierungsstreifens oder -linie der Art mit einer Mehrzahl von beabstandeten Vorsprüngen auf einer Straßenoberfläche, umfassend eine bewegliche Markierungselemente-Verlegeeinheit (2), die mit einer einstellbaren Geschwindigkeit über die Straßenoberfläche bewegt werden kann, ein integriertes Markierungselemente-Verlegegerät (24) zum Verlegen der vorgeformten Markierungselemente (40), wobei das genannte integrierte Markierungselemente-Verlegegerät (24) ein Magazin (42) zur Aufnahme einer Mehrzahl der genannten vorgeformten Markierungselemente (40) aufweist, ein Mittel (32) zur Entnahme eines Elementes (40) in gewählten Zeitabständen (40) aus dem Magazin (42), Mittel (54, 58, 60) zum Verlegen der genannten vorgeformten Markierungselemente (40) auf die Straßenoberfläche, dadurch gekennzeichnet, daß spezielle Heizmittel vorgesehen sind, die so gerichtet werden, daß sie die Markierungselemente erhitzen, so daß sich auf der Unterseite der Markierungselemente, wenn sie in ihrer Position auf der Farblinie oder Straßenoberfläche liegen, eine Schicht aus erweichtem Material bildet, die aus dem Material der Platte besteht und mit der Straßenoberfläche oder der zuvor aufgetragenen Farblinie verklebt.
2. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß das Heizmittel (26) vorgesehen ist, um die Straßenoberfläche oder die zuvor aufgetragene Farblinie vor dem Aufbringen des Markierungselementes darauf zu erhitzen.
3. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß ferner ein Basisstreifenauftragsmittel zum Aufbringen eines Basisstreifens auf die Straßenoberfläche vor dem Aufbringen der Markierungselemente (40) darauf vorgesehen ist.
4. Verfahren zur Herstellung eines/einer Markierungsstreifens oder -linie auf einer Straßenoberfläche

oder einer zuvor aufgetragenen Farblinie, wobei das Verfahren die folgenden Schritte umfasst: Bewegen einer Markierungselemente-Verlegeeinheit (2) über die Oberfläche der Straße, Aufbringen einer Mehrzahl von Markierungselementen (40) entlang der genannten Oberfläche der Straße oder der zuvor aufgetragenen Farblinie; Regeln des Abstands zwischen nacheinander aufgetragenen Markierungselementen (40), dadurch gekennzeichnet, daß die Unterseite der genannten Markierungselemente (40) mit Wärme beaufschlagt wird, um eine Bondschicht aus erweichtem Material des Markierungselementes zu bilden, so daß die genannte Bondschicht mit der Straßenoberfläche oder der zuvor aufgetragenen Farblinie verklebt.

5. Verfahren nach Anspruch 4, dadurch gekennzeichnet, daß die Bondschicht aus erweichtem Material auf der Unterseite der Markierungselemente gebildet wird, die mit der Straßenoberfläche oder der zuvor aufgetragenen Farblinie Kontakt erhalten.
6. Verfahren nach Anspruch 5, dadurch gekennzeichnet, daß vor der Durchführung des genannten Schrittes des Aufbringens der Markierungselemente der weitere Schritt des Ladens einer Mehrzahl von vorgefertigten Platten (40) in ein Magazin (42) in der genannten Markierungselemente-Verlegeeinheit vorgesehen ist.
7. Verfahren nach Anspruch 4, dadurch gekennzeichnet, daß die Straßenoberfläche oder die zuvor aufgetragene Farblinie durch ein Heizmittel (26) vor dem Aufbringen der Markierungselemente darauf erhitzt wird.

Revendications

1. Appareil servant à réaliser une section à surface ondulée ou une ligne de délimitation d'un type ayant une pluralité de saillies à des intervalles réguliers sur la surface d'une chaussée, comprenant une unité mobile de pose (2) de plaquettes à nervures capable de se déplacer à des vitesses pouvant être déterminées à l'avance sur la surface de la chaussée ; un équipement intégré de pose (24) de plaquettes à nervures permettant de poser les plaquettes préformées à nervures (40), ledit équipement intégré de pose (24) de plaquettes à nervures comprenant un magasin-chargeur (42) destiné à contenir une pluralité desdites plaquettes préformées à nervures (40) ; des moyens (32) pour enlever une plaquette (40) du magasin-chargeur (42) à des intervalles de temps sélectionnés ; des moyens (54, 58, 60) pour positionner lesdites plaquettes préformées à nervures (40) sur la surface de la chaussée, et caractérisé en ce que des moyens de

chauffage spécialement conçus à cet effet ont été prévus et sont destinés à chauffer les plaquettes à nervures, de sorte qu'au moment où les plaquettes à nervures se trouvent en position sur la ligne de peinture ou la surface de la chaussée, la face inférieure de celles-ci va présenter une couche de matériau ramolli formé à partir du matériau de la plaquette à nervures dans le but de liasonner avec la surface de la chaussée ou la ligne de peinture pré-appliquée.

2. Un appareil, selon les stipulations de la revendication 1, caractérisé en ce que les moyens de chauffage (26) sont prévus pour chauffer la surface de la chaussée ou la ligne de peinture pré-appliquée avant d'y appliquer la plaquette à nervures.
3. Un appareil, selon les stipulations de la revendication 1, caractérisé en ce que l'on a prévu en outre des moyens d'application de bande de base destinés à appliquer une bande de base sur la surface de la chaussée avant l'application des plaquettes à nervures (40).
4. Une méthode permettant de former une section à surface ondulée ou une ligne de délimitation sur une surface de chaussée ou une ligne de peinture pré-appliquée, la méthode comprenant les étapes suivantes : déplacer une unité de pose (2) de plaquettes à nervures le long de la surface de la chaussée ; déposer une pluralité de plaquettes à nervures (40) le long de ladite surface de chaussée ou ligne de peinture pré-appliquée ; contrôler la distance entre les plaquettes à nervures (40) déposées en séquence et caractérisée par l'application de la chaleur sur la face inférieure desdites plaquettes à nervures (40) dans le but de former une couche de liaisonnement de matériau ramolli de la plaquette à nervures, de sorte que ladite couche de liaisonnement adhère à la surface de la chaussée ou à la ligne de peinture pré-appliquée.
5. Une méthode, selon les stipulations de la revendication 4, caractérisée en ce que la couche de liaisonnement de matériau ramolli est formée sur la face inférieure des plaquettes à nervures qui entrent en contact avec la surface de la chaussée ou la ligne de peinture pré-appliquée.
6. Une méthode, selon les stipulations de la revendication 5, caractérisée en ce qu'avant de réaliser l'étape consistant à déposer les plaquettes à nervures, on a prévu une étape supplémentaire consistant à charger une pluralité de plaquettes à nervures (40) fabriquées au préalable dans un magasin-chargeur (42) dans ladite unité de pose de plaquettes à nervures.

7. Une méthode, selon les stipulations de la revendication 4, caractérisée en ce que la surface de la chaussée ou la ligne de peinture pré-appliquée est chauffée par des moyens de chauffage (26) avant d'y appliquer les plaquettes à nervures.

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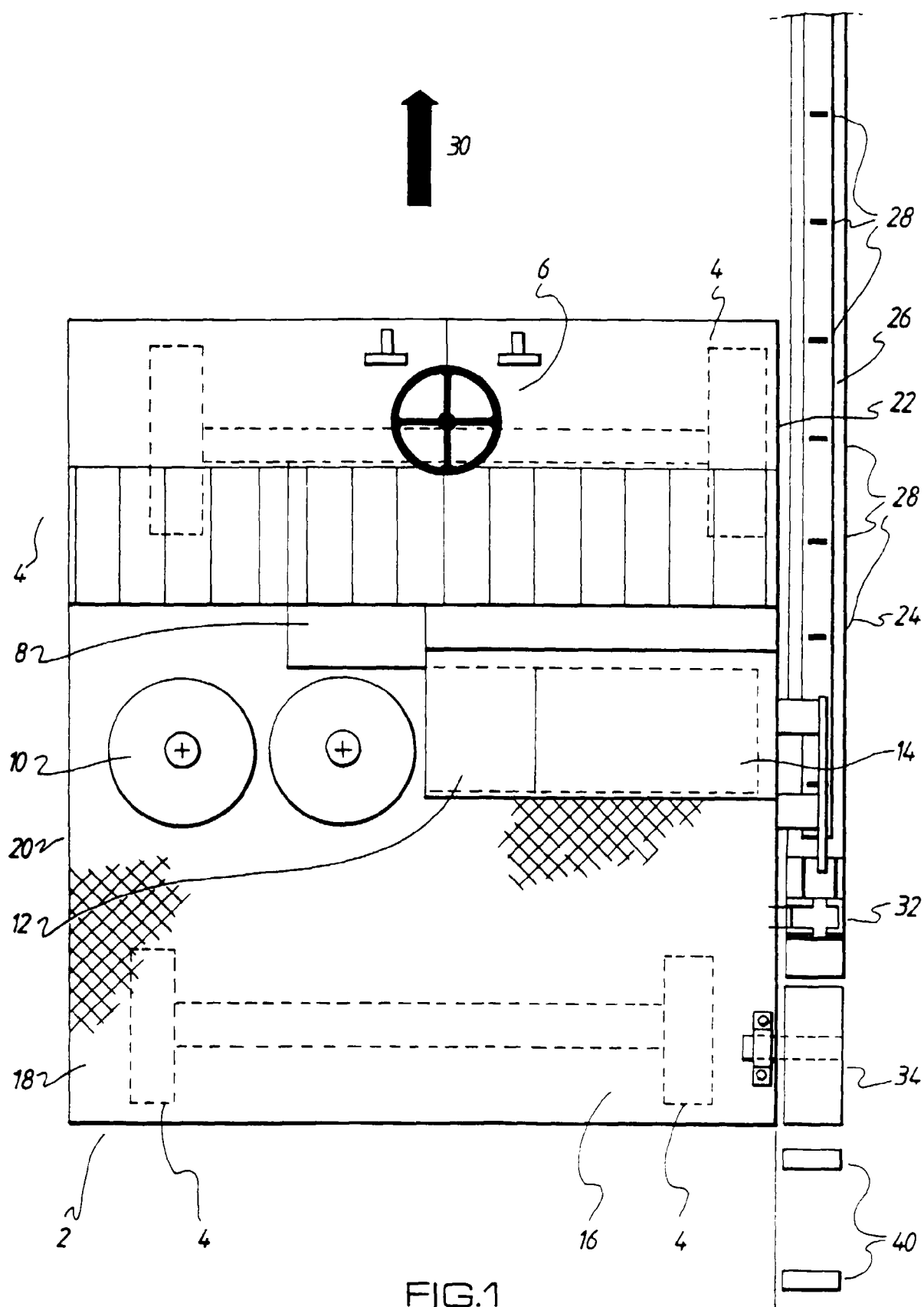
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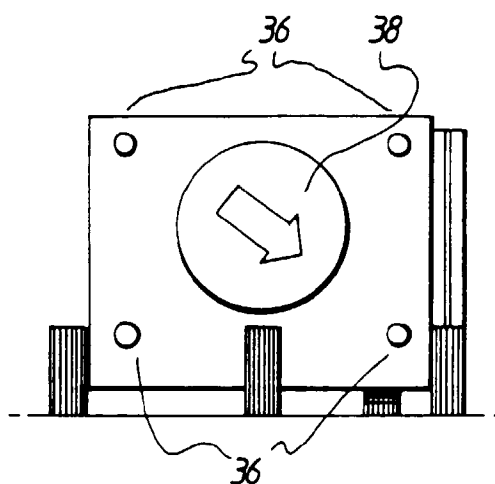


FIG. 2

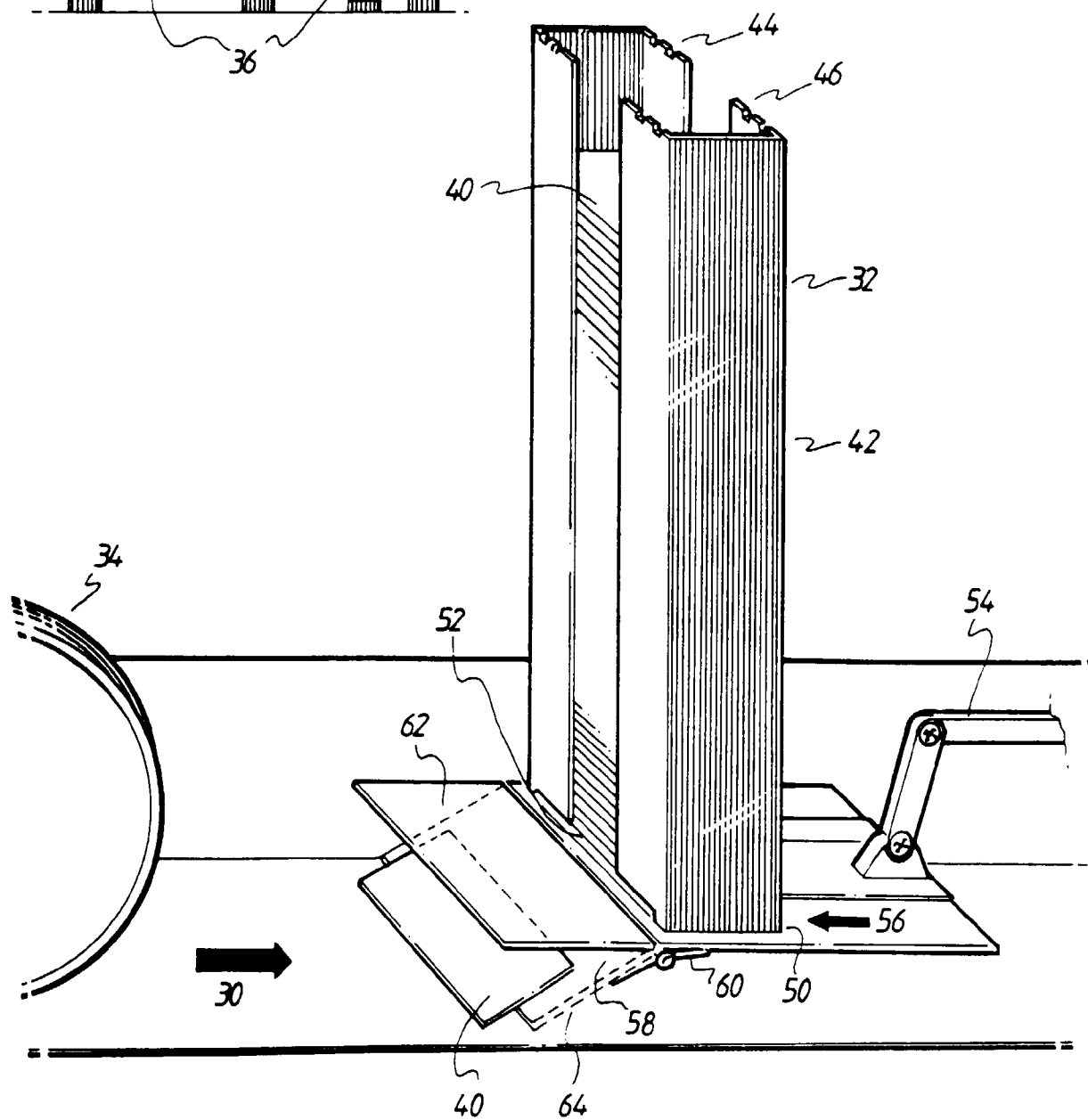


FIG. 3

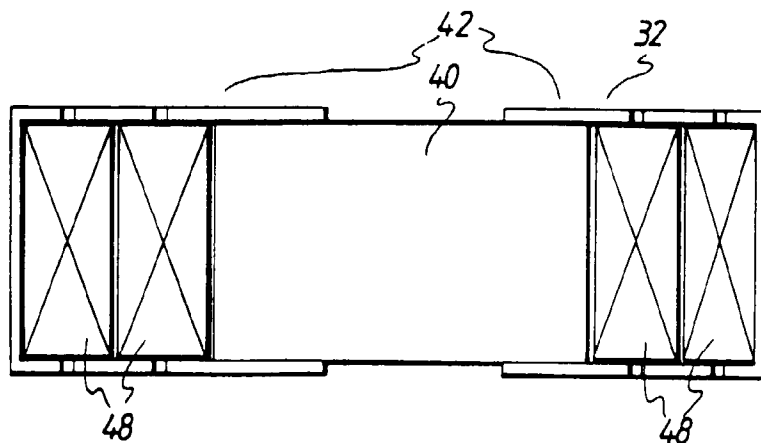


FIG. 4

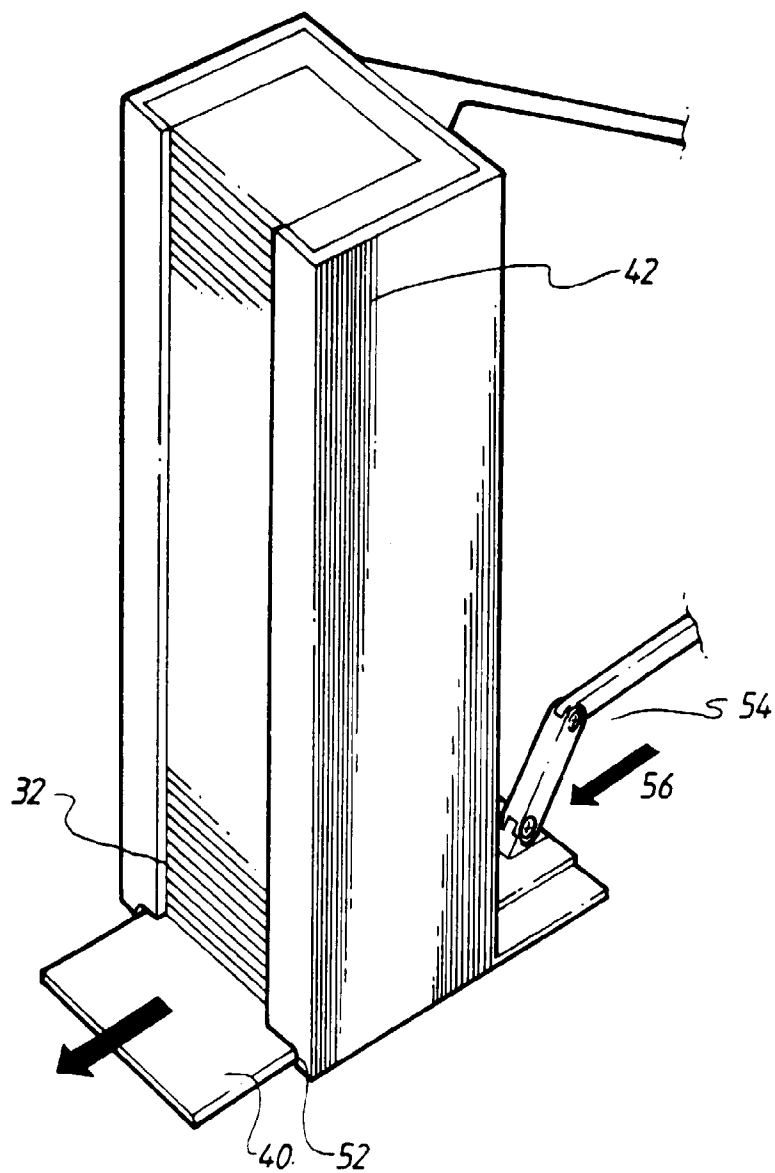


FIG. 5

