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(56) References cited:
FR-A- 2 408 013
GB-A- 1 560 469
GB-A- 2 024 900

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Description

This invention relates to a paving machine for laying concrete and pulverulant materials such as asphalt on substrates such as road foundations or the ground. In particular, the present invention relates to a screed plate finisher for use in conjunction with a paving machine.

Paving machines may be self propelled or constitute an accessory constructed for mounting on a vehicle. Self propelled paving machines normally employ a hopper for carrying hot asphalt for distribution using augers over an area to be paved. During movement of the machine a screed plate serves to strike-off and level-off deposited asphalt prior to compaction of the so laid asphalt by, for example, tamping or rolling. In order to produce a cambered, or, reverse cambered - a so called gulley - two or more screed plates may be used and, by adjusting the screed plate relative to a substrate foundation the thickness of asphalt laid may be varied in a direction transverse to the direction of laying.

British Patent GB-A-1 560 469 Joseph Vogele A.G. describes and claims an extensible screed plate finisher for concrete or bituminous paving materials comprising a main plate fixed on support arms of the finisher, and at least one extra plate which is disposed behind the main plate in the direction of operation and which extends approximately over half the length of the main plate and which is connected to the main plate by means of guides and is laterally extensible by means of a displacement drive, and wherein the main plate carries a guide tube for receiving guide means connected to the extra plate, two guide elements are provided in spaced superposed relationship at the outer rear end of the main plate, and a rail fixed on the extra plate is guided between said guide elements. The guide means used in the Vogele finisher are constructed in the form of a telescopic tube and the guide elements are rollers disposed on eccentrics.

In the embodiment described in the above Patent GB-A-1560469 both the inner and outer surfaces of the outer guide tube needed to be machined accurately and the rail had a projecting web, both surfaces of which needed to be machined accurately flat and parallel.

Patent Application GB-A-2 024 900 describes a road paving machine having a screed plate finisher of variable overall width and comprising first and second parts. The second part extends along and is reciprocable along the first part to vary the width of the screed. The second part is supported from the first part by a telescopic support of non-circular cross section which prevents rotation between the telescopic members whilst permitting longitudinal extension and contraction to thereby vary the overall width of the screed plate finisher.

It is an object of the present invention to provide a paving machine with a supporting mechanism for the extending plates which is improved in these respects.

According to one aspect of the present invention there is provided a paving machine having a main screed plate and at least one extension screed plate mounted to the rear, when considered in the direction of normal operation of the machine, of the main screed plate and extendible laterally outwards and in which the main screed plate assembly carries a guide tube receiving guide means attached to the or each extension screed plate and with means for supporting the extension screed plate against rotation about the axis of the guide tube, wherein the means for preventing such rotation comprises a pair of guide rails fixed in relation to the main screed plate and attached or closely adjacent in parallel relationship to the guide tube characterised in that the means further comprises pressure pads fixed in relation to the extension screed plate and bearing on the guide rails so as to oppose rotation in one direction of the extension screed plate about the axis of the guide tube under its own weight, and with a further guide rail fixed in relation to the extension screed plate and with a pressure pad fixed in relation to the main screed plate bearing on the further guide rail so as to oppose rotation in the reverse direction of the extension screed plate assembly due to pressure against the ground. Preferably, the guide rails of the pair are rebated into grooves in the guide tube. Conveniently the pressure pad bearing on the rail of the extension screed plate assembly is provided with adjustment means.

The invention also includes a paving machine having a main screed plate and at least one extension screed plate mounted to the rear, when considered in the direction of normal operation of the machine, of the main screed plate and extendible laterally outwards and in which the main screed plate assembly carries a guide tube receiving guide means attached to the or each extension screed plate and with means for supporting the extension screed plate against rotation about the axis of the guide tube, wherein the means for preventing such rotation comprises at least two guide rails which are fixed in relation to the extension screed plate (8) characterised in that said guide rails are located in positions which are parallel and lateral of each other and parallel and lateral with respect to the guide tube, each guide rail having an associated pressure pad fixed in relation to the main screed plate and bearing on its respective rail in such a sense that at least one guide rail opposes rotation in one direction of the extension screed plate about the guide tube (6) under its own weight and that at least one other guide rail opposes rotation in the reverse direction of the extension screed plate (8) due to pressure against the ground. Preferably each guide rail and its associated pressure pad is disposed on the same side of the guide tube. Conveniently, the laterally outermost guide rail and associated pressure pad opposes rotation of the extension screed plate due to pressure against the ground.

The invention will be further described with reference to the accompanying drawings in which

Figure 1 is a simplified plan view of the supporting mechanism for the extending plates;

Figure 2 is a vertical section along the line A-A of Figure 1;

Figure 3 is a detail showing an adjustable bearing pad;

Figure 4 is a simplified plan view of a supporting mechanism for the extension plates of a second embodiment of the invention, and

Figure 5 is a section taken through B - B of Figure 4.

Each of these figures is diagrammatic and very much simplified, showing only components relevant to the present invention.

Referring first to Figure 1, a main screed plate assembly is in two halves only one of which, the left hand half, is shown in Figure 1. The main screed assembly is supported between two end plates, 1, 2 which are held spaced apart and parallel to each other by a tube 3 of rectangular section and by a structure comprising a pair of rectangular section rails 4, 5 and a tube of circular section 6, which is the guide tube for the extension plate and forms the outermost of a set of three telescopic tubes. A main screed plate itself is designated 7 in Figure 2.

An extension screed plate 8 which is also to be seen in Figure 2, is likewise supported between two end plates 9, 10 spaced apart by a tube 11 of rectangular section carrying a rail 12. The end plate 9 which is disposed outboard of the assembly carries an innermost tube 13 of one of the three telescopic tubes working within the guide tube 6. The extension screed plate 8 is extended or retracted by operation of a hydraulic jack 14 operating between the outer end plate 9 of the extension screed plate assembly and the inner plate 2 of the assembly carrying one half of the main screed plate.

The end and inner plate 10 of the extension screed plate assembly carries a boss 15 with a central opening 16 affording clearance for the outside of the guide tube 6. The boss 15 supports a pair of pressure pads 17, 18, one of which 17 engages a machined under surface of the rail 4 and the other of which 18 engages a machined upper surface of the rail 5. The surfaces of these rails which are not engaged by the pressure pads do not need to be machined accurately parallel or flat. The action of the pressure pads on these rails supports the weight of the extension screed plate assembly when it is clear of the ground. The rails 4 and 5 must be rigid enough for this purpose and they may themselves be supported on tubes or struts between the end plates, or, as indicated in Figure 2, rebated slightly into grooves milled in the sides of the guide tube 6.

The rectangular tube 11 of the extension tube assembly, as already described carries a rail 12 which is machined on its upper surface for engagement with a pressure pad 19, shown in more detail in Figure 2. The pressure pad 19 is shown in greater detail in Figure 3 and comprises a block 20 of low friction material supported by a pair of adjusting screws 21, 22. The pressure of the block 20 on the rail 12 supports the reaction of the ground against the extension screed plate 8 less the weight of the extension itself and, as wear takes place, the screws can be advanced to compensate. This adjustment is well clear of the internal mechanism of the extension support assembly and readily accessible for adjustment by an operator. Further, machined bearing surface of the rail 12 itself is readily accessible for cleaning.

Referring to Figures 4 and 5 in which similar parts to those shown in Figures 1, 2 and 3 are designated by the same reference numerals, the extension screed plate is supported by end plates 9 and 10 as well as guide tube 13 which slides telescopically within guide tube 6 which serves as a bridge between end plates 1 and 2. The guide tube 6 is constructed in the same manner as described with reference to Figures 1 and 2. The embodiment of Figures 4 and 5 differs from that of Figures 1 and 2 in the arrangement of guide rails and pressure pads. In Figures 4 and 5, the guide rails are designated 4A and 5A respectively with associated pressure pads 4B and 5B respectively. Each of the guide rails 4A and 5A are mounted in parallel between end plates 9 and 10 and the pressure pads 5A/5B are constructed as shown in Figure 3. Displacement of the extension screed plate 8 into and out of the plane of Figure 5 (left to right and right to left of Figure 4) under the guidance of the guide tube 6 is effected by single stage, double acting hydraulic or pneumatic rams 26/26A. Ram 26 serving to control the left hand extension screed plate (when viewed in Figure 4) and Ram 26A serving to control the right hand extension plate.

Although the Rams 26/26A are shown in figure to be mounted laterally of each other and laterally of the guide tube 6, if desired, they may be mounted vertically above each other. Further, an additional tubular support 11 may be used to maintain and reinforce the spaced relationship of end plates 1 and 2 and 9 and 10 respectively.

Referring to Figure 5, the pressure pads 4B and 5B for guide rails 4A and 5A are each carried on the end plates 1 and 10 as shown so as to permit movement of the guide rails 4A and 5A in the direction of arrows "x" and "y" in Figure 4 .

Claims

1. A paving machine having a main screed plate (7) and at least one extension screed plate (8) mounted to the rear, when considered in the direction of normal operation of the machine, of the main screed plate (7) and extendible laterally outwards and in which the main screed plate (7) assembly carries a guide tube (6) receiving guide means attached to the or each extension screed plate (8) and with means for supporting the extension screed plate

against rotation about the axis of the guide tube, wherein the means for preventing such rotation comprises a pair of guide rails (4, 5) fixed in relation to the main screed plate (7) and attached or closely adjacent in parallel relationship to the guide tube (6) characterised in that the means further comprises pressure pads (17, 18) fixed in relation to the extension screed plate and bearing on the guide rails so as to oppose rotation in one direction of the extension screed plate about the axis of the guide tube under its own weight, and with a further guide rail (12) fixed in relation to the extension screed plate and with a pressure pad (19) fixed in relation to the main screed plate bearing on the further guide rail (12) so as to oppose rotation in the reverse direction of the extension screed plate assembly due to pressure against the ground.

2. A paving machine according to claim 1, in which the guide rails (4, 5) of the pair are rebated into grooves in the guide tube.

3. A paving machine according to claim 1 or claim 2, in which the pressure pad (19) bearing on the rail (12) of the extension screed plate assembly (8) is provided with adjustment means (21, 22).

4. A paving machine having a main screed plate (7) and at least one extension screed plate (8) mounted to the rear, when considered in the direction of normal operation of the machine, of the main screed plate (7) and extendible laterally outwards and in which the main screed plate (7) assembly carries a guide tube (6) receiving guide means attached to the or each extension screed plate (8) and with means for supporting the extension screed plate against rotation about the axis of the guide tube, wherein the means for preventing such rotation comprises at least two guide rails (4A, 5A) which are fixed in relation to the extension screed plate (8) characterised in that said guide rails (4A, 5A) are located in positions which are parallel and lateral of each other and parallel and lateral with respect to the guide tube, each guide rail (4A, 5A) having an associated pressure pad (4B, 5B) fixed in relation to the main screed plate (7) and bearing on its respective rail in such a sense that at least one guide rail opposes rotation in one direction of the extension screed plate (8) about the guide tube (6) under its own weight and that at least one other guide rail opposes rotation in the reverse direction of the extension screed plate (8) due to pressure against the ground.

5. A paving machine according to claim 4 characterised in that each guide rail (4A, 5A) and its associated pressure pad (4B, 5B) is disposed on the same side of the guide tube (6).

6. A paving machine according to claim 4 or claim 5 characterised in that the laterally outermost guide rails (5A) and associated pressure pad (5B) opposes rotation of the extension screed plate due to pressure against the ground.

Patentansprüche

1. Pflastermaschine mit einer Haupt-Abziehplatte (7) und mindestens einer Erweiterungs-Abziehplatte (8), die bezüglich der Richtung des normalen Betriebs der Maschine hinter der Haupt-Abziehplatte (7) gehaltert ist und seitlich nach außen ausgefahren werden kann, und bei der der Aufbau der Haupt-Abziehplatte (7) ein Führungsrohr (6) trägt, welches eine an der/den Erweiterungs-Abziehplatte/n (8) angebrachte Führungseinrichtung aufnimmt, und mit einer Einrichtung zum Stützen der Erweiterungs-Abziehplatte gegen ein Drehen um die Achse des Führungsrohrs, bei der die Einrichtung zum Verhindern eines derartigen Drehens ein Paar Führungsschienen (4, 5) umfaßt, die in Bezug auf die Haupt-Abziehplatte (7) ortsfest sind und am Führungsrohr (6) befestigt bzw. in einer parallelen Beziehung direkt neben ihm angeordnet sind, dadurch gekennzeichnet, daß die Einrichtung ferner Druckkissen (17, 18) umfaßt, die in Bezug auf die Erweiterung-Abziehplatte ortsfest sind und an den Führungsschienen anliegen, um einem Drehen der Erweiterungs-Abziehplatte in einer Richtung um die Achse des Führungsrohrs unter ihrem Eigengewicht entgegenzuwirken, und mit einer weiteren Führungsschiene (12), die in Bezug auf die Erweiterungs-Abziehplatte ortsfest ist, und mit einem Druckkissen (19), das in Bezug auf die Haupt-Abziehplatte ortsfest ist und an der weiteren Führungsschiene (12) anliegt, um einem Drehen des Erweiterungs-Abziehplattenaufbaus in umgekehrter Richtung aufgrund von Druck gegen den Boden entgegenzuwirken.

2. Pflastermaschine nach Anspruch 1, bei der die Führungsschienen (4, 5) des Paars in Rillen im Führungsrohr eingefügt sind.

3. Pflastermaschine nach Anspruch 1 oder Anspruch 2, bei der das an der Schiene (12) des Erweiterungs-Abziehplattenaufbaus (8) anliegende Druckkissen (19) mit einer Einstellungseinrichtung (21, 22) bereitgestellt ist.

4. Pflastermaschine mit einer Haupt-Abziehplatte (7) und mindestens einer Erweiterung-Abziehplatte (8), die bezüglich der Richtung des normalen Betriebs der Maschine hinter der Haupt-Abziehplatte (7) gehaltert ist und seitlich nach außen ausgefahren werden kann, und bei der der Aufbau der Haupt-

Abziehplatte (7) ein Führungsrohr (6) trägt, welches eine an der/den Erweiterung-Abziehplatte/n (8) angebrachte Führungseinrichtung aufnimmt, und mit einer Einrichtung zum Stützen der Erweiterung-Abziehplatte gegen ein Drehen um die Achse des Führungsrohrs, bei der die Einrichtung zum Verhindern eines derartigen Drehens mindestens zwei Führungsschienen (4A, 5A) umfaßt, die in Bezug auf die Erweiterungs-Abziehplatte (8) ortsfest sind, dadurch gekennzeichnet, daß die Führungsschienen (4A, 5A) in Positionen angeordnet sind, die zueinander parallel und seitlich und in Bezug auf das Führungsrohr parallel und seitlich sind, wobei jede Führungsschiene (4A, 5A) ein zugeordnetes Druckkissen (4B, 5B) aufweist, das in Bezug auf die Haupt-Abziehplatte (7) ortsfest ist und an seiner jeweiligen Schiene in einer solchen Richtung anliegt, daß mindestens eine Führungsschiene einem Drehen der Erweiterungs-Abziehplatte (8) in einer Richtung um das Führungsrohr (6) unter ihrem Eigengewicht entgegenwirkt, und daß mindestens eine andere Führungsschien einem Drehen der Erweiterungs-Abziehplatte (8) in umgekehrter Richtung aufgrund von Druck gegen den Boden entgegenwirkt.

5. Pflastermaschine nach Anspruch 4, dadurch gekennzeichnet, daß jede Führungsschiene (4A, 5A) und ihr zugeordnetes Druckkissen (4B, 5B) auf der gleichen Seite des Führungsrohrs (6) angeordnet ist.

6. Pflastermaschine nach Anspruch 4 oder Anspruch 5, dadurch gekennzeichnet, daß die seitlich am weitesten außen liegende Führungsschiene (5A) und das zugeordnete Druckkissen (5B) einem Drehen der Erweiterungs-Abziehplatte aufgrund von Druck gegen den Boden entgegenwirkt.

Revendications

1. Machine de pavage possédant une plaque principale (7) égaliseuse et au moins une plaque de rallonge (8) égaliseuse, montée à l'arrière, lorsqu'on considère la direction du fonctionnement normal de la machine, de la plaque principale (7) égaliseuse et étirable dans la direction latérale vers l'extérieur, et dans laquelle l'assemblage de plaque principale (7) égaliseuse porte un tube de guidage (6) accueillant un moyen de guidage attaché à la ou à chaque plaque de rallonge (8) égaliseuse et ayant un moyen servant à soutenir la plaque de rallonge égaliseuse et l'empêcher de tourner autour de l'axe du tube de guidage, dans laquelle le moyen pour empêcher une telle rotation comprend une paire de barres de guidage (4, 5) fixes par rapport à la plaque principale (7) égaliseuse et attachées au tube de guidage (6) ou étroitement adjacentes en relation parallèle à ce dernier, caractérisée en ce que le moyen comprend en outre des tampons de pression (17, 18) fixes par rapport à la plaque de rallonge égaliseuse et s'appuyant sur les barres de guidage de manière à s'opposer à une rotation dans un sens de la plaque de rallonge égaliseuse autour de l'axe du tube de guidage sous l'action de son propre poids, et possédant une barre de guidage supplémentaire (12) fixe par rapport à la plaque de rallonge égaliseuse et un tampon de pression (19) fixe par rapport à la plaque principale égaliseuse et s'appuyant sur la barre de guidage supplémentaire (12) de manière à s'opposer à une rotation dans le sens inverse de l'assemblage de plaque de rallonge égaliseuse due à la pression s'exerçant sur le sol.

2. Machine de pavage selon la revendication 1, dans laquelle les barres de guidage (4, 5) de la paire sont encastrées dans des rainures pratiquées dans le tube de guidage.

3. Machine de pavage selon la revendication 1 ou la revendication 2, dans laquelle le tampon de pression (19) s'appuyant sur la barre (12) de l'assemblage de plaque de rallonge (8) égaliseuse est pourvu d'un moyen d'ajustement (21, 22).

4. Machine de pavage possédant une plaque principale (7) égaliseuse et au moins une plaque de rallonge (8) égaliseuse, montée à l'arrière, lorsqu'on considère la direction du fonctionnement normal de la machine, de la plaque principale (7) égaliseuse et étirable dans la direction latérale vers l'extérieur, et dans laquelle l'assemblage de plaque principale (7) égaliseuse porte un tube de guidage (6) accueillant un moyen de guidage attaché à la ou à chaque plaque de rallonge (8) égaliseuse et ayant un moyen servant à soutenir la plaque de rallonge égaliseuse et l'empêcher de tourner autour de l'axe du tube de guidage, dans laquelle le moyen pour empêcher une telle rotation comprend au moins deux barres de guidage (4A, 5A) qui sont fixes par rapport à la plaque de rallonge (8) égaliseuse, caractérisée en ce que lesdites barres de guidage (4A, 5A) sont situées dans des positions qui sont mutuellement parallèles et latérales et parallèles et latérales par rapport au tube de guidage, chaque barre de guidage (4A, 5A) possédant un tampon de pression associé (4B, 5B) fixe par rapport à la plaque principale (7) égaliseuse et s'appuyant sur sa barre respective dans un sens tel qu'au moins une barre de guidage s'oppose à une rotation dans un sens de la plaque de rallonge (8) égaliseuse autour du tube de guidage (6) sous l'action de son propre poids et qu'au moins l'autre barre de guidage s'oppose à une rotation dans le sens inverse de la plaque de rallonge (8) égaliseuse due à la pression

s'exerçant sur le sol.

5. Machine de pavage selon la revendication 4, caractérisée en ce que chaque barre de guidage (4A, 5A) et son tampon de pression associé (4B, 5B) est disposé(e) du même côté que le tube de guidage (6).

6. Machine de pavage selon la revendication 4 ou la revendication 5, caractérisée en ce que les barres de guidage (5A) les plus extérieures dans la direction latérale et leurs tampons de pression associés (5B) s'opposent à une rotation de la plaque de rallonge égaliseuse due à la pression s'exerçant sur le sol.

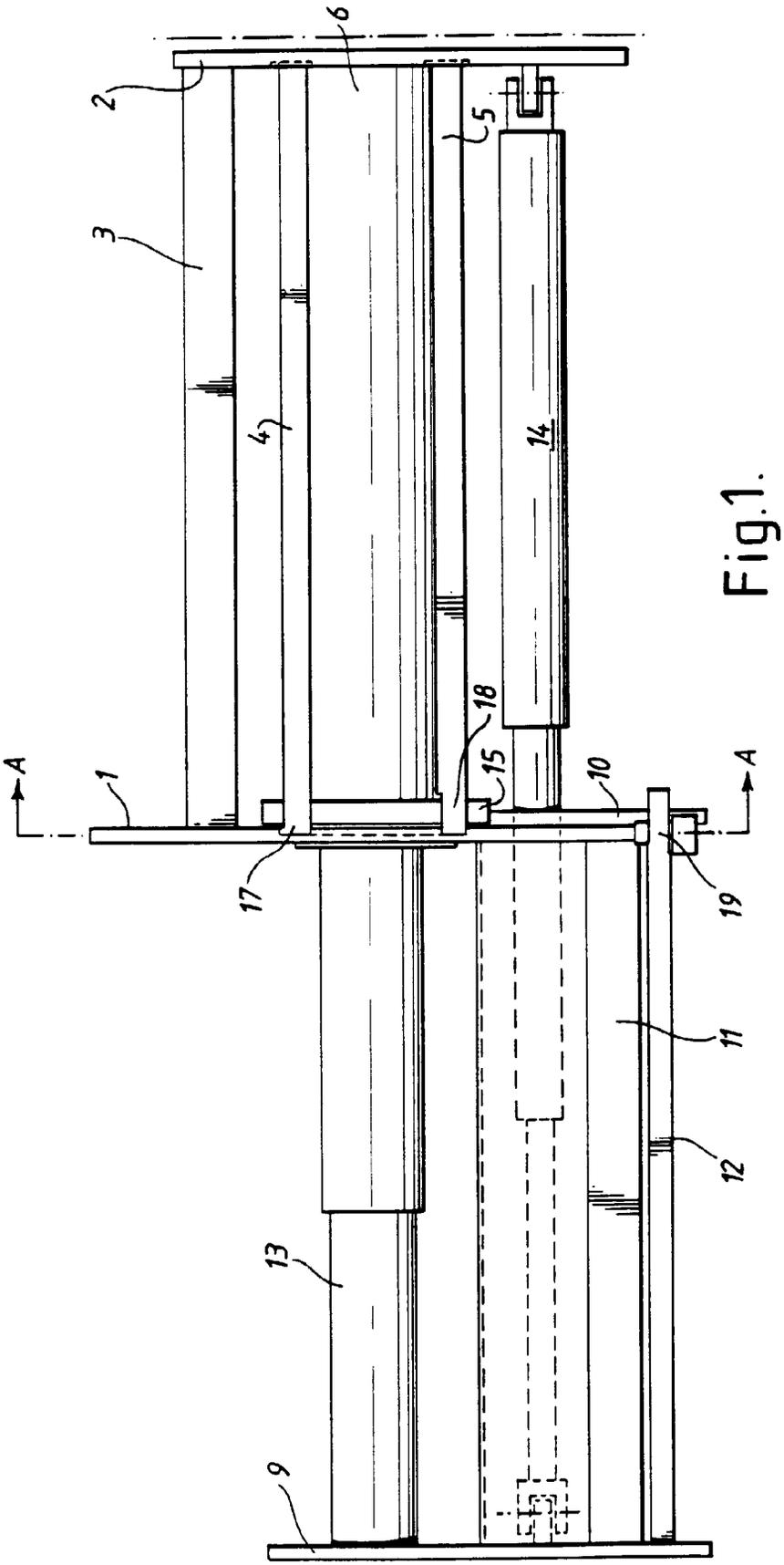
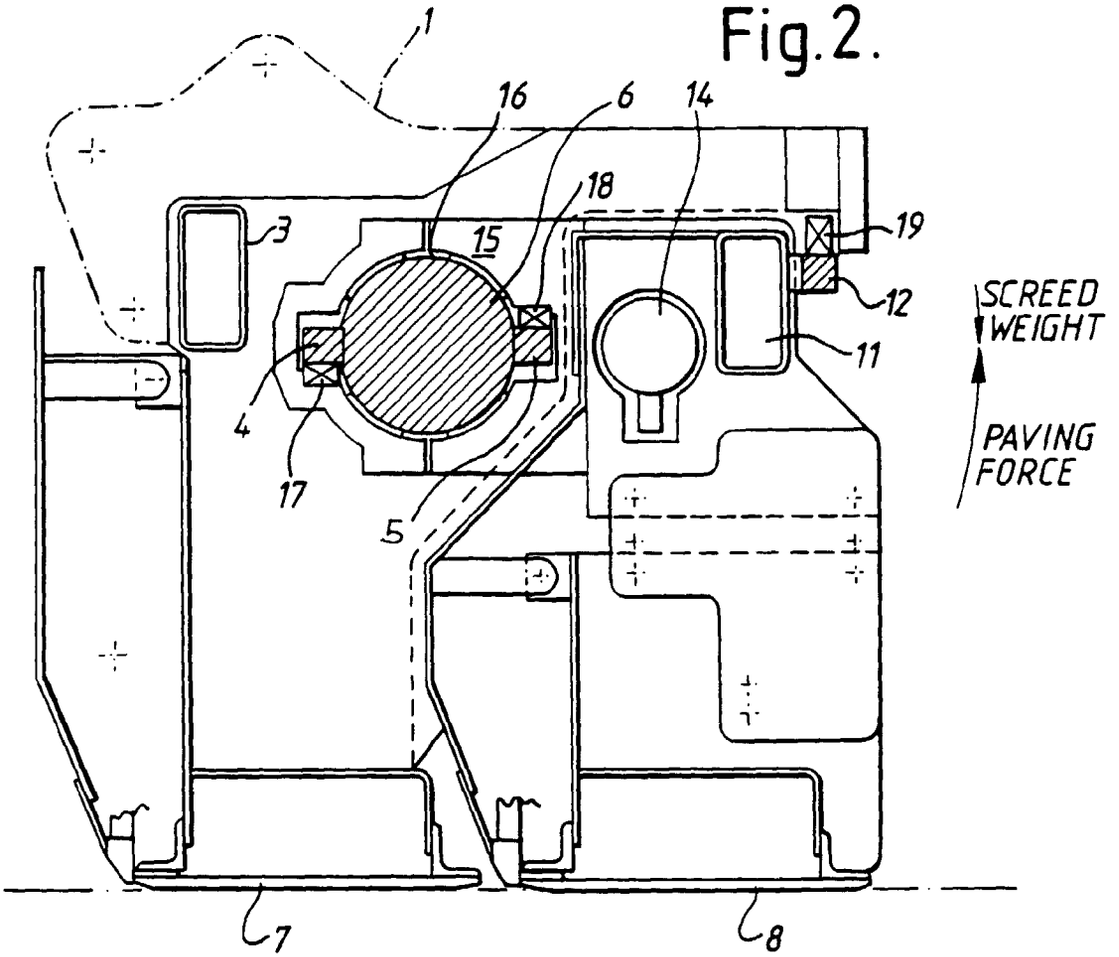


Fig.1.

Fig.2.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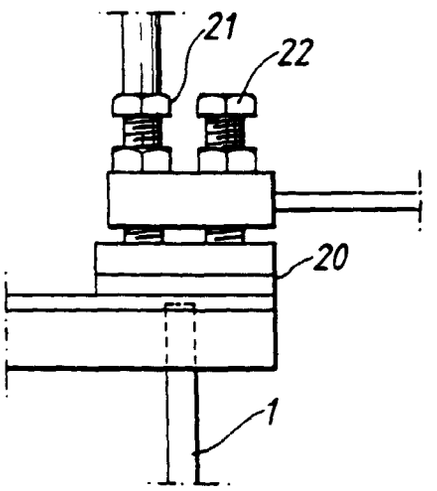
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Fig.3.

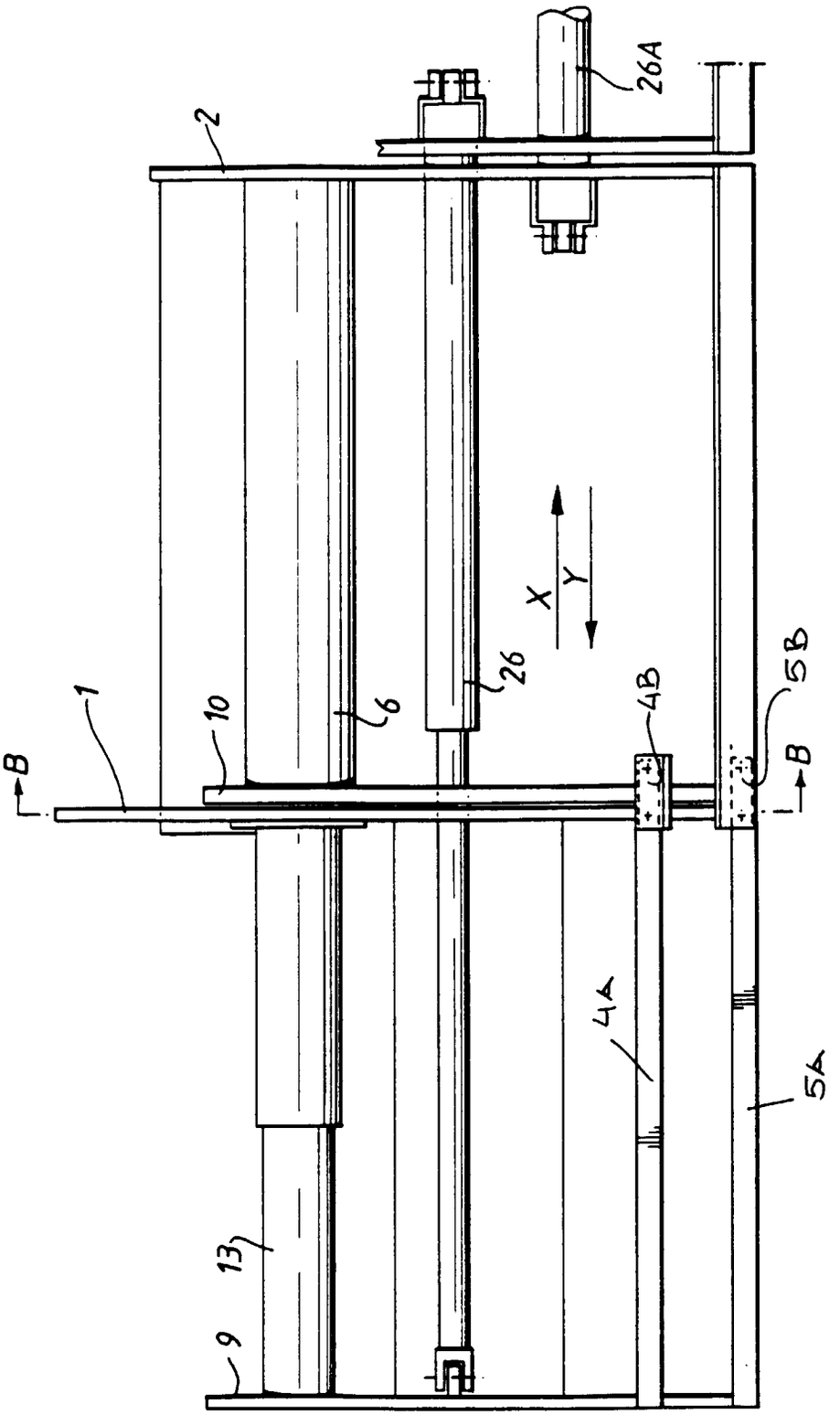

Fig.4.

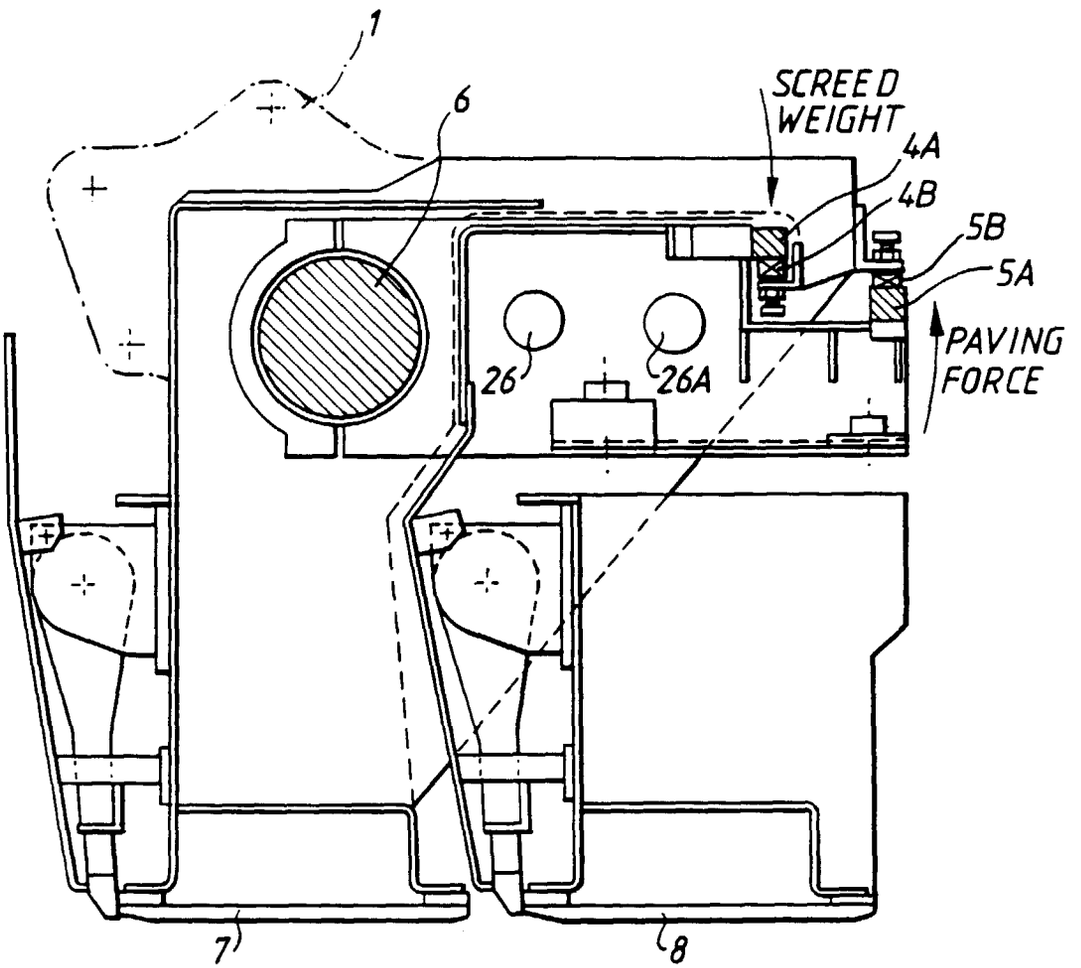

Fig.5.