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(71) Applicant: **Scambia Industrial Developments AG**
9494 Schaan (LI)

(72) Inventor: **Burger, Jan**
0041, Pretoria Gauteng (ZA)

(74) Representative: **Bohest AG**
Postfach 160
4003 Basel (CH)

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(54) **Base plate for jacks**

(57) A base plate for jacks, in particular for scissors jacks, is made of sheet steel and has generally a bow tie shape with flared ends (25, 26) and a narrower neck portion (24). The base plate is at least partially being provided with raised flanges (27, 28) along the longitudinal

side of the base plate (2). The base plate is further provided with at least one transverse rib (30) which extends transversely to the longitudinal extension of the base plate (2) from one raised flange (27) to the opposite raised flange (28).

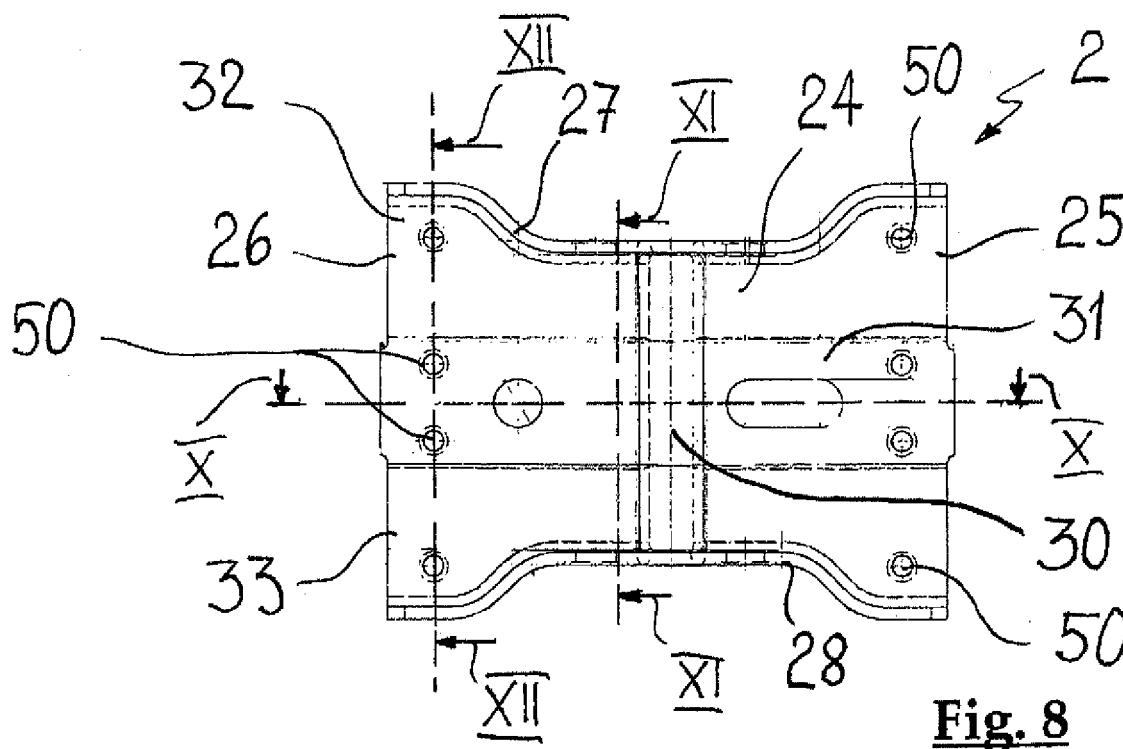


Fig. 8

Description

[0001] The invention generally relates to a base plate for jacks, in accordance with the preamble of claim 1 and to a jack, e.g. a scissors jack, comprising such a base plate.

[0002] Vehicles usually are equipped with a portable jack to enable a driver to lift the vehicle in an emergency case, e.g., for changing a flat tire. One popular type of jack for automobiles is the so-called scissors jack, which also is designated as pantograph jack. From EP-0 773 185 A2 a scissors jack is known which comprises four arms hinged in a parallelogram at four joints. One joint is positioned at a base plate of the jack. Another joint is located at a load support vertically above the base plate. Two free floating joints are located on a horizontal diagonal at opposite corners of the parallelogram formed by the arms. The free floating joints are linked by a drive spindle. When the spindle is turned, the free floating joints are drawn together or moved away from each other along the extension of the spindle, and thus, the load support is lifted or lowered, respectively, with respect to the base plate.

[0003] When a wheel of an automobile is lifted, the automobile is also slightly pivoted about an axis that is formed by the other wheel on the same longitudinal side thereof, remaining on the ground. Thus, a given point along the longitudinal side of the car follows a curved path, i.e., a circular arc. In order to avoid an oblique application of force attempts have been made to allow the jack to follow this circular arc during the lifting operation. In GB-A-2 045 205 it is suggested to provide a Y-type jack with a base plate made of light metal and having a slightly curved configuration in a direction which is vertical to its length. While it is expressed that by this measure a sloping of a road shall be compensated, this configuration may also contribute to a compensation of the curved path, the longitudinal side of the car follows during the lifting operation. The curved base plate, however, makes an initial alignment of the jack with respect to the sill at the longitudinal underside of the automobile more difficult. In addition to the curved configuration it is suggested to provide the base plate along its length with a raised portion. The raised portion is supposed to allow a tilting of the jack in order to avoid deformation due to forces which may be caused by the action of wind or by a person leaning against the car body. From the prior art also a scissors jack is known, which is provided with a base plate of a similar configuration as that of the Y-type jack of

[0004] GB-A-2 045 205. Thus, the base plate is slightly curved in a direction vertical to its longitudinal extension, in order for the scissors jack to be able to follow the curved path of the car side during the lifting operation. In order to avoid any risk of damage of the components of the jack during operation, e.g., due to an oblique application of load force, this known scissors jack is of a quite massive construction. Because of the relatively high wall

thickness of its components, however, the scissors jack is rather heavy, and it is expensive in manufacture.

[0005] Another type of a jack is shown in EP-A-1 002 757. This type of jack comprises a stand and a carrier arm having a load support. The carrier arm together with the load support is movable along the stand by means of a drive spindle, so that actuation of the drive spindle results in the carrier arm together with the load support being lifted. As the sill at the longitudinal underside of the car rests on the load support and the drive spindle is actuated, the car is lifted (or later on lowered, respectively). The curved path which the car follows during the lifting operation is compensated for by two segments of the base plate which are arranged inclined relative to one another. While the jack rests on one segment of the base plate when it is positioned underneath the car during movement the jack tilts to rest on the other segment of the base plate which is arranged inclined relative thereto.

[0006] In automobile construction the reduction of weight and thus the saving of fuel is a constant topic. In the attempt to save on overall weight, particular focus is made on auxiliary equipment, which does not form a permanent part of the automobile. While a jack may not contribute very much to the overall weight of the automobile; nevertheless it is a focus of automotive suppliers to reduce its weight. On the other hand the jack must still be able to withstand the mechanical strains during operation and guarantee a safe handling.

[0007] Thus, it is an object of this invention to provide the prerequisites for a modification of a known jack which is capable to follow the curved path of the longitudinal side of an automobile during the lifting operation such, that the above-mentioned contradictory goals may be met. A solution is to be provided which is easy and cost-effective to manufacture.

[0008] This object and still further objects are achieved through a base plate for jacks in accordance with the features of claim 1. Further advantageous embodiments of the base plate are the subject of the dependent claims.

[0009] The invention suggests a base plate for jacks having - in a plan view - generally a bow tie shape with flared ends and a narrower neck portion. At least partially along the longitudinal side of the base plate it is provided with raised flanges. The base plate is made of sheet steel. The base plate is provided with at least one transverse rib which extends transversely to the longitudinal extension of the base plate, from one raised flange to the opposite raised flange.

[0010] By providing the base plate with at least one transverse rib which extends transversely to the longitudinal extension of the base plate from one raised flange to the opposite raised flange, the overall stiffness of the base plate is increased. This allows to manufacture the base plate from sheet steel of reduced wall thickness and thereby to reduce the weight. Irrespective of the reduced wall thickness the mechanical properties, i.e. the stiffness and resistance to deformation under load is maintained. Bearing in mind that the base plate contributes consid-

erably to the overall weight of the jack, a reduction of the weight of the base plate has an immediate positive effect on the overall weight reduction of the jack equipped with such a base plate. The transverse orientation of the rib increases the mechanical stiffness of the base plate along its entire breadth. By this measure the fact is taken into account, that due to the curved path which the longitudinal side of an automobile follows during the lifting operation, the deformation forces under load also follow a transverse path across the breadth of the base plate.

[0011] In one embodiment of the base plate according to the invention, the raised flanges are at least provided along the longitudinal sides of the neck portion. The raised flanges have through bores for receiving fastening elements for two lower arms of a scissors jack. The at least one transverse rib is arranged in the neck portion of the base plate. This embodiment of the base plate is particularly adapted for scissors jacks.

[0012] For simplification of manufacture process and for weight reasons, the rib in the base plate is formed by a bead in the support surface of the neck portion, thereby increasing the mechanical stiffness of the base plate.

[0013] In a further embodiment of the invention it proves convenient if there is provided one bead which is located about halfway of the longitudinal extension of the neck portion. Surprisingly already one single central bead increases the mechanical stiffness of the base plate considerably. Thus, the base plate can be made of thinner sheet metal, and weight can be saved.

[0014] In a further embodiment of the invention the base plate the raised flanges extend longitudinally from one flare end to the other flared end, that is to say over the entire length of the base plate.

[0015] According to a further embodiment the base plate a central flat region with a central support surface extending towards the flared ends, from which a raised region extends to each raised flange, each raised region having an inclined support surface. These raised allow a tilting of the jack if necessary.

[0016] In order to further increase the stiffness of the base plate according to the invention, and in order to enhance the grip of the base plate on the ground protrusions may be provided, on which the base plate rests. Preferably there are provided four protrusions at the support surfaces of the flared ends. Two protrusions can be provided at the central support surface and one protrusion at each inclined support surface. The protrusions may be steel rivets or like enforcing elements. By having the raised flanges extend longitudinally from one flared end to the other flared end the stiffness of the base plate is further increased.

[0017] In a still further embodiment of the base plate according to the invention there are provided two through bores at each raised flange. The through bores are arranged in pairs of corresponding through bores, opposite each other at the respective raised flanges. One pair of corresponding through bores is provided at a different height of the raised flanges than the other pair of opposing

through bores. By having the trough bores for receiving the fastening elements for the lower arms of the scissors jack at different heights of the raised flanges of the base plate the pivot axes of the lower arms are located at different heights above the ground. The lower arms are mounted to the ground plate such, that the pivot axis of the arm next to the engagement means of the drive spindle is located higher above the ground than the pivot axis of the second lower arm. This arrangement takes into account that during the lifting operation the longitudinal side of an automobile is also pivoted about the two wheels on the other longitudinal side thereof, which rest on the ground. Thus, the lifted longitudinal side of the automobile follows a curved path which extends vertically to the longitudinal side. By having the pivot axes of the lower arms at different heights above the ground, i.e. the pivot axis of the arm next to the engagement means of the driving spindle higher above the ground than the pivot axis of the second lower arm, the scissors jack can follow the curved path of the lifted longitudinal side of the automobile and compensate therefor such, that shear forces on the scissors jack are reduced.

[0018] In accordance with another embodiment of the base plate according to the invention, which is particularly suitable for a jack comprising a stand and a carrier arm having a load support arranged above the base plate, the raised flanges are provided with a through bore for receiving fastening elements for the stand of a jack. The at least one transverse rib is provided in each of the flared ends rather than in the neck portion.

[0019] By providing the base plate with at least one transverse rib (bead) - regardless of whether the at least one rib is provided in the neck portion or in the respective flared ends, the base plate may be made of sheet steel, which has a wall thickness of only about 2 mm to about 3 mm. Thus, compared to base plates of jacks of the prior art, the overall weight is reduced considerably.

[0020] The base plate can be formed by stamping, punching and bending operations. These non-chip forming methods are fast and cost efficient.

[0021] Another aspect of the invention relates to a scissors jack with a base plate according to the invention. The scissors jack comprises four arms, which are hinged in a parallelogram at four joints. One joint is positioned at the base plate of the jack, another joint is located at a load support vertically above the base plate. Two free floating joints are located on a horizontal diagonal at opposite corners of the parallelogram formed by the arms. The two free floating joints are linked by a drive spindle as described above. Even if all other components of the scissors jack are manufactured in a conventional manner, the base plate according to the invention contributes considerably to the overall weight reduction of the jack. Nonetheless, the mechanical properties of the scissors jack are comparable to those of the much heavier and more expensive ones of the prior art.

[0022] Still another aspect of the invention relates to a jack with a base plate according to the invention. The

jack comprises a stand and a carrier arm having a load support arranged above the base plate. The carrier arm is arranged to be movable along the stand by means of a drive spindle, as this is known from the prior art.

[0023] Further advantages, features and variants follow from the description below of an exemplary embodiment of the invention with the aid of the drawings in which (in a not-to-scale schematic representation):

- Fig. 1 shows an automobile with an applied scissors jack according to the invention prior to lifting;
- Fig. 2 shows an enlarged detail of the scissors jack, indicated in Fig. 1 by encirclement II;
- Fig. 3 shows the automobile in a lifted condition;
- Fig. 4 shows an enlarged detail of the scissors jack, indicated in Fig. 3 by encirclement IV;
- Fig. 5 shows a perspective view of a scissors jack according to the invention;
- Fig. 6 shows a front view of the scissors jack according to Fig. 3;
- Fig. 7 shows a side view of the scissors jack according to Fig. 3;
- Fig. 8 shows a top plan view of a base plate for a scissors jack according to the invention;
- Fig. 9 shows a view at the longitudinal side of the base plate according to Fig. 8;
- Fig. 10 shows a longitudinal sectional view of the base plate according to section line X-X in Fig. 8;
- Fig. 11 shows a cross-sectional view of the base plate according to section line XI-XI in Fig. 8;
- Fig. 12 shows a cross-sectional view of the base plate according to section line XII-XII in Fig. 8;
- Fig. 13 shows a view at the longitudinal side of another embodiment of the base plate corresponding to the view in Fig. 9;
- Fig. 14 shows a sheet metal strip of base plates according to the invention during manufacture;
- Fig. 15 shows a side view of the lower part of a jack with a further embodiment of a base plate according to the invention, the jack having a stand and a carrier arm (not shown) which is movable along the stand;
- Fig. 16 shows a top view on the embodiment of the

base plate shown in Fig. 15;

- Fig. 17 shows a lateral side view of the embodiment of the base plate shown in Fig. 15,
- Fig. 18 shows a view of a jack of the type shown in Fig. 15 but with a known base plate,
- Fig. 19 shows a perspective front view of the base plate of a jack shown in Fig. 22-24,
- Fig. 20 shows a perspective rear view of the base plate of Fig. 19,
- Fig. 21 shows a section along line XXI-XXI of Fig. 20,
- Fig. 22 shows a further embodiment of a jack having a base plate of the type shown in Fig. 19-21, with the load support in its lowermost (unlifted) position,
- Fig. 23 shows the jack of Fig. 22, with the load support in a partially lifted position, and
- Fig. 24 shows the jack of Fig. 22, with the load support in its fully lifted position.

[0024] In Figs. 1 and 3 an automobile 100 resting on a scissors jack 1 according to the invention is schematically shown in two positions. While Fig. 1 depicts the condition prior to the lifting operation, Fig. 3 shows the automobile 100 with its front wheel 103 lifted off the ground. In Fig. 1 the scissors jack 1 is shown in engagement with a sill 102, which extends along the longitudinal side 101 on the underside of the automobile body. The scissors jack 1 rests with its base plate 2 on the ground 2. Fig. 2 shows an enlarged detail according to encirclement II in Fig. 1. The scissors jack 1 rests with a central support surface 21 of its base plate 2 on the ground G. From the central support surface 21 inclined support surface portions 22, 23 extend on both sides.

[0025] Schematic Fig. 3 shows the automobile 100 with its front wheel 103 lifted. During the lifting operation the longitudinal side 101 of the automobile 100 is pivoted about an axis which is formed by the respective rear wheel 104. Thus, the region of the sill 102, where the scissors jack 1 is engaged, during the lifting operation follows a curved, i.e., circular path. In order to ascertain that the load forces are transmitted substantially vertically into the base plate 2, the latter is allowed to follow the curved path. As shown in Fig. 4, in the lifted condition the scissors jack rests on the inclined support surface portion 23, which extends towards the rear wheel 104, and lies substantially flat on the ground. Thus, the inclined support surface portions 22, 23 of the base plate enable a compensation of the curved path, which the supported sill 102 of the automobile 100 follows during the lifting operation.

[0026] In Figs. 5 - 7 the scissors jack according to the invention is generally designated with reference numeral 1. The scissors jack 1 comprises a base plate 2 and four arms 3, 4, 5, 6 hinged in a parallelogram at four joints 7, 8, 10, 11. Two lower arms 3, 4, at one end thereof are provided with gears and are mounted such on the base plate 2 that the gears interact. One joint 7 is positioned at the base plate 2 of the scissors jack 1. Another joint 8 is located at a load support 9 vertically above the base plate 2. Two free floating joints 10, 11 are located on a horizontal diagonal at opposite corners of the parallelogram formed by the arms 3 - 6. The free floating joints 10, 11 are linked by a drive spindle 12, which at one end thereof bears an engaging means 13, such as, e.g., an eye connection for a hand crank (not shown). When the drive spindle 12 is turned with the hand crank, the free floating joints 10, 11 are drawn together or moved away from each other along the extension of the drive spindle 12, and thus, the load support 9 is lifted or lowered, respectively, with respect to the base plate 2.

[0027] In Figs. 8 - 12 the base plate 2 of the scissors jack is shown in different views. The base plate 2 has generally a bow tie shape and comprises a narrower neck portion 24 and two flared ends 25, 26. Two raised flanges 27, 28 extend longitudinally, preferably from one flared end 25 to the other flared end 26. At the narrower neck portion 24 the raised flanges 27, 28 are provided with bores 29 for receiving trunnions for the lower arms of the scissors jack. The base plate 2 is provided with a transverse rib 30 which extends in the narrower neck portion 24 vertically to the longitudinal extension of the base plate 2, from one raised flange 27 to the opposite raised flange 28.

[0028] As can be seen from Figs. 9 and 10 the transverse rib 30 is formed by a bead in the support surface 21 of the neck portion 24. Thus, no additional material is added to the base plate; rather the base plate 2 is reinforced by this metal forming operation. The base plate 2 comprises a central flat region 31 which extends longitudinally from one flared end 25 to the other flared end 26 thereof. From the central flat region 31 raised regions 32, 33 extend towards the raised flanges 27, 28. Correspondingly, the base plate 2 has a central support surface 21, which is joined, on both sides thereof, by inclined support surfaces 22, 23 (Fig. 12). The central flat support surface 21 provides for an easy initial alignment of the scissors jack with respect to the sill of an automobile. The inclined support surfaces 22, 23 allow a compensation of the curved path the sill takes during the lifting operation of a front and a rear wheel of the automobile, respectively (Figs. 1 - 4).

[0029] Further reinforcement of the base plate 2 may be achieved by providing the flared ends 25 26 with steel rivets 50, which protrude from the support surface 21 - 23. More specifically, two of the rivets 50 protrude from the central support surface 21, one rivet 50 each from the inclined support surfaces 22 and 23, respectively. The steel rivets 50 ascertain that the load forces engage

vertically into the base plate 2, even in cases where the ground is uneven.

[0030] Fig. 13 shows another embodiment of a base plate according to the invention. For the sake of better understanding like reference numerals designate like elements. On each raised flange 27 there are provided two through bores 29, 29*. The through bores are arranged in pairs of corresponding through bores, opposite each other on the respective raised flanges. One pair of corresponding through bores 29 is arranged at height d of the raised flanges which is higher than that d^* the other pair of corresponding through bores 29*. The heights of the two pairs of corresponding pairs of through bores 29, 29* are offset with respect to each other by a distance $d - d^*$, which amounts to about 1.0 mm - 8 mm. The lower arms of the scissors jack are mounted to the ground plate 2 such, that the pivot axis of the arm next to the engagement means of the drive spindle, which extends across through bores 29 is located higher above the ground than the pivot axis of the second lower arm at through bore 29*. This arrangement takes into account that during the lifting operation the longitudinal side of an automobile is also pivoted about the two wheels on the other longitudinal side, which rest on the ground. Thus, the lifted longitudinal side of the automobile follows a curved path which extends vertically to the longitudinal side. By having the pivot axes of the lower arms at different heights above the ground, i.e. the pivot axis of the arm next to the engagement means of the driving spindle higher above the ground than the pivot axis of the second lower arm, the scissors jack can follow the curved path of the lifted longitudinal side of the automobile and compensate therefor such, that shear forces on the scissors jack are reduced.

[0031] The base plate 2, which according to the invention is provided with a transverse rib 30, which is formed by a bead in the support surface, may be made from thin sheet steel. The thickness of the sheet steel, at least in the neck portion thereof, is about 2 mm - 3 mm. As it is shown in Fig. 14 the base plate 2 is made from a continuous sheet of steel 200 by stamping, punching and bending operations.

[0032] In Fig. 15 a side view of the lower part of a jack 1A with a further embodiment of a base plate 2A according to the invention is shown, while Fig. 16 and Fig. 17 show a top view and a side view of the base plate 2A. The jack 1A has a stand 10A and a carrier arm 11A (not shown in Fig. 15, see Fig. 18) carrying a load support 12A (not shown in Fig. 15 either, see Fig. 18). The carrier arm together with the load support can be moved along the stand with the aid of a drive spindle 13A (see Fig. 18) causing the carrier arm to be pivoted about a bolt or about rivets or the like, as this is conventional. For the general operation of this type of jack it is referred to EP-A-1 002 757. However, the base plate 2A is different from the base plate shown in EP-A- 1 002 757. In EP-A- 1 002 757 the stand is fixedly attached to the base plate. In order to allow the tilting of the jack during the lifting op-

eration, the base plate in EP-A- 1 002 757 comprises two sections which are inclined relative to another. In the embodiment of the jack shown in Fig. 15 the stand 10A is attached to base plate 2A with the aid of through bores 29A provided in the flanges 27A, 28A and with steel rivets or the like. The flanges 27A, 28A extend over the entire length of the base plate 2A. However, during the lifting operation the stand 10A can be tilted about the steel rivet. For that reason, the stand is provided with two base surfaces 100A and 101A which are arranged inclined relative to one another, similar to the inclined arrangement of the sections of the base plate in the afore-mentioned EP-A-1 002 757. Accordingly, in the lowered position (shown in Fig. 15) the stand 10A rests on base surface 100A while in the lifted position the stand 10A rests on base surface 101A.

[0033] The base plate 2A comprises transverse ribs in the form of beads 30A, with (at least) one rib 30A being arranged in each of the flared ends 25A, 26A rather than in neck portion 24A. The base plate 2A comprises a central flat region 31A which extends longitudinally from one flared end 25A to the other flared end 26A thereof. From the central flat region 31A raised regions 32A, 33A extend towards the raised flanges 27A, 28A. Correspondingly, the base plate 2A has a central support surface 21A, which is joined, on both sides thereof, by inclined support surfaces 22A, 23A (Fig. 17). The central flat support surface 21A provides for an easy initial alignment of the scissors jack with respect to the sill of an automobile. The inclined support surfaces 22A, 23A allow a compensation of the curved path the sill takes during the lifting operation of a front and a rear wheel of the automobile, respectively.

[0034] Fig. 19-21 show a perspective front view, a perspective rear view, and a sectional view of a further embodiment of a base plate 2B for a jack 1 B which will be described further below with the aid of Fig. 22-24. Generally, base plate 2B is somehow similar to that already described with reference to Figs. 15-17. Base plate 2B comprises transverse ribs in the form of beads 30B, with one of the ribs 30B being arranged in each of the flared ends 25B, 26B while a through bore 29B is provided in the neck portion 24B between the flared ends 25B, 26B for attachment of the stand 10B of the jack to the base plate 2B with the aid of a bolt. The base plate 2B comprises a central flat region 31 B which extends longitudinally from one flared end 25B of the base plate to the other flared end 26B. From the central flat region 31 B raised regions 32B, 33B extend towards raised flanges 27B, 28B. Correspondingly, the base plate has a central support surface 21 B, which is joined, on both sides thereof, by inclined surfaces 22B, 23B. These inclined surfaces allow for a compensation of the curved path the automobile takes during the lifting operation of a front or rear wheel of the automobile.

[0035] In addition, base plate 2B comprises an eyelet 34B for attachment of one end of a spring (see Figs. 22-24) to the base plate 2B. Also, base plate 2B comprises a protrusion 35B serving as an abutment for the

stand 10B of the jack when the load support is in its fully lifted position.

[0036] Figs. 22-24 show perspective views of the already mentioned embodiment of the jack 1 B with the load support in its lowermost, partially lifted, and uppermost position, respectively. The jack 1 B comprises a stand 10B and a carrier arm 11 B carrying a load support 12B. The carrier arm 12B can be moved along the stand 10B (through a pivotal movement about a bolt or rivets or the like, see partially lifted position of the load support in Fig. 23) with the aid of a drive spindle 13B, as this is conventional. The working principle of such type of jack is well-known in the art and is known, for example, from the afore-mentioned EP-A-1 002 757. However, in EP-A-1 002 757 the stand is fixedly attached to the base plate of the jack and, therefore, the base plate of the jack of EP-A-1 002 757 comprises two sections which are inclined relative to one another. In contrast thereto, the stand 10B of the jack 1 B of the instant invention is attached to the base plate 2B with the aid of a bolt 14B extending through the through bores 29B of the base plate 2B, thus connecting the stand 10B to the base plate 2B. During the lifting operation, the stand 10B can be tilted about the bolt 14B until it reaches its fully erected position (Fig. 24). In this position, the stand 10B abuts against protrusion 35B (see Fig. 20) so that stand 10B cannot be tilted about bolt 14B any further.

[0037] Although not discussed in detail, it goes without saying that the base plate 2B of the jack 1 B may also comprise steel rivets which protrude from the support surfaces of the base plate (similar to the rivets 50 of the embodiment of the base plate shown in Fig. 8). For example, four such rivets may be provided in flared end 26B (one in each of the raised regions and one in the central region), two such rivets may be provided in the neck portion (both being provided in the central region) and two such rivets may be provided in flared end 25B (one in each of the raised regions), as this is evident from Figs. 19-21.

Claims

1. Base plate for jacks, in particular for scissors jacks, the base plate (2; 2A; 2B) being made of sheet steel and having generally a bow tie shape with flared ends (25, 26; 25A, 26A; 25B, 26B) and a narrower neck portion (24; 24A; 24B), and further at least partially being provided with raised flanges (27, 28; 27A, 28A; 27B, 28B) along the longitudinal side of the base plate (2; 2A; 2B), **characterized in that** the base plate (2; 2A; 2B) is provided with at least one transverse rib (30; 30A; 30B) which extends transversely to the longitudinal extension of the base plate (2; 2A; 2B) from one raised flange (27; 27A; 27B) to the opposite raised flange (28; 28A; 28B).
2. Base plate for jacks according to claim 1, wherein

the raised flanges (27, 28) are at least provided along the longitudinal sides of the neck portion (24), the raised flanges having through bores (29, 29*) for receiving fastening elements for two lower arms (3, 4) of a scissors jack (1), and wherein further the at least one transverse rib (30) is provided in the neck portion (24) of the base plate.

3. Base plate for jacks according to claim 1 or claim 2, wherein the transverse rib (30) is formed by a bead in the support surface (21, 22, 23) of the neck portion (24). 10
4. Base plate for jacks according to claim 3, wherein there is provided one bead which is located about halfway of the longitudinal extension of the neck portion (24). 15
5. Base plate for jacks according to any one of the preceding claims, wherein the raised flanges (27, 28) extend longitudinally from one flared end (25) to the other flared end (26). 20
6. Base plate for jacks according to claim 4 or 5, wherein the flared ends (25, 26) each are provided with protrusions (50) at the support surfaces (21, 22, 23). 25
7. Base plate for jacks according to claim 6, wherein at each flared end (25, 26) there are provided four protrusions (50), two of which are provided at the central support surface (21) and two are arranged at the inclined support surfaces (22, 23). 30
8. Base plate for jacks according to any one of the preceding claims, wherein there are provided two pairs of corresponding through bores (29, 29*) opposing each other at the raised flanges (27, 28), with one pair of corresponding through bores (29) being arranged at a different height of the raised flanges (27, 28) than the other pair of corresponding through bores (29*). 35
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9. Base plate for jacks according to claim 1, wherein the raised flanges (27A, 28A; 27B, 28B) are provided over the entire length of the base plate, wherein in the neck portion (24A; 24B) the raised flanges (27A, 28A; 27B, 28B) are provided with a through bore (29A; 29B) for receiving fastening elements for the stand (10A; 10B) of a jack (1A; 1 B), and wherein at least one transverse rib (30A; 30B) is provided in each of the flared ends (25A, 26A; 25B, 26B) of the base plate. 45
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10. Base plate for jacks according to any one of the preceding claims, wherein the sheet steel has a wall thickness of about 2 mm - about 3 mm. 55
11. Base plate for jacks according to any one of the pre-

ceding claims, formed from a continuous band of sheet steel by stamping, punching and bending operations.

12. Base plate for jacks according to any one of the preceding claims, wherein the neck portion (24; 24A; 24B) comprises a central flat region (31; 31 A; 31 B) with a central support surface (21; 21A; 21 B) extending towards the flared ends (25, 26; 25A, 26A; 25B, 26B), from which a raised region (32, 33; 32A, 33A; 32B, 33B) extends to each raised flange (27, 28; 27A, 28A; 27B, 28B), each raised region (32, 33; 32A, 33A; 32B, 33B) having an inclined support surface (22, 23; 22A, 23A; 22B, 23B). 5
13. Scissors jack (1) comprising four arms (3, 4, 5, 6) hinged in a parallelogram at four joints (7, 8, 10, 11), one joint (7) being positioned at a base plate (2) of the jack (1), another joint (8) being located at a load support (9) vertically above the base plate (2), two free floating joints (10, 11) being located on a horizontal diagonal at opposite corners of the parallelogram formed by the arms (3, 4, 5, 6), and the two free floating joints (10, 11) being linked by a drive spindle (12), **characterized by** a base plate (2) in accordance with any one of claims 1 to 8. 10
14. Jack (1A; 1 B) comprising a stand (10A; 10B) and a carrier arm having a load support (12A; 12B) arranged above the base plate (2A, 2B), the carrier arm (11A; 11b) being arranged to be movable along the stand (10A; 10B) by means of a drive spindle (13A, 13B), **characterized by** a base plate (2A, 2B) in accordance with claim 1 or any one of claims 9 to 12. 15

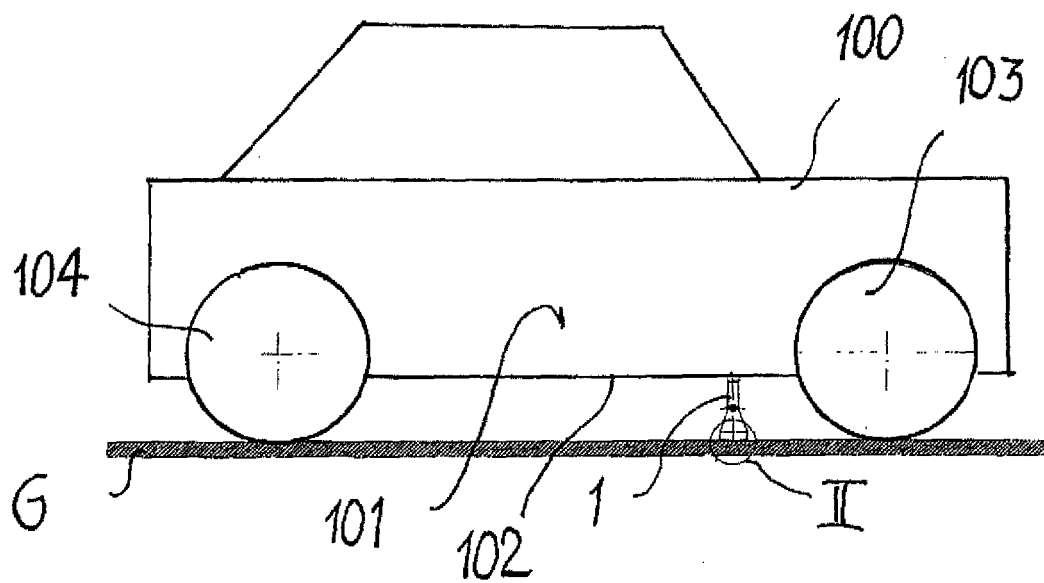


Fig. 1

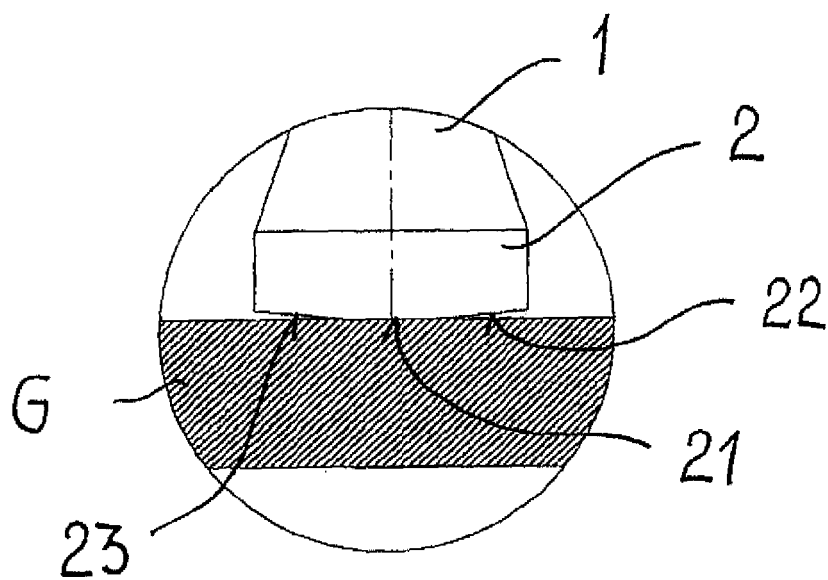


Fig. 2

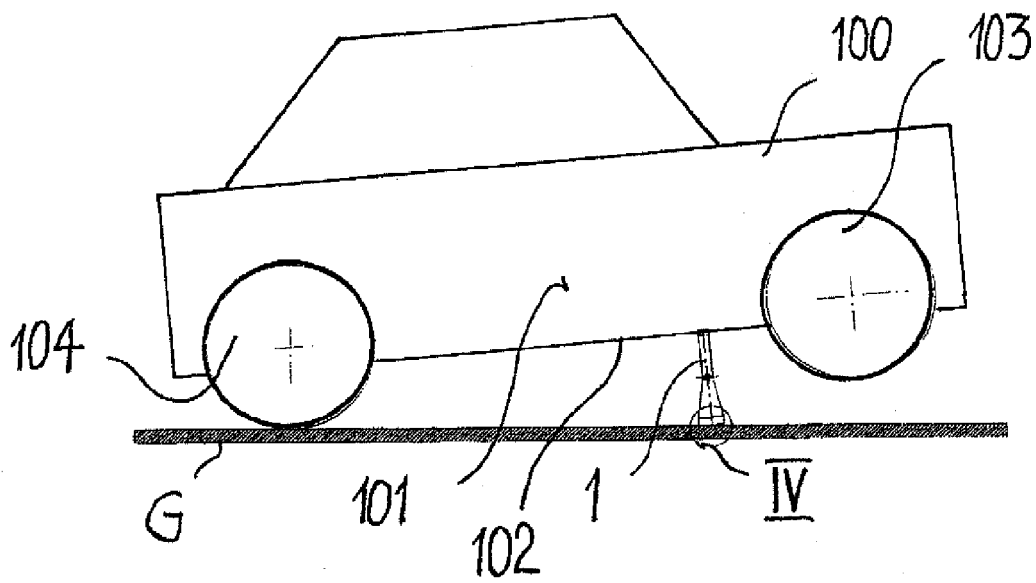


Fig. 3

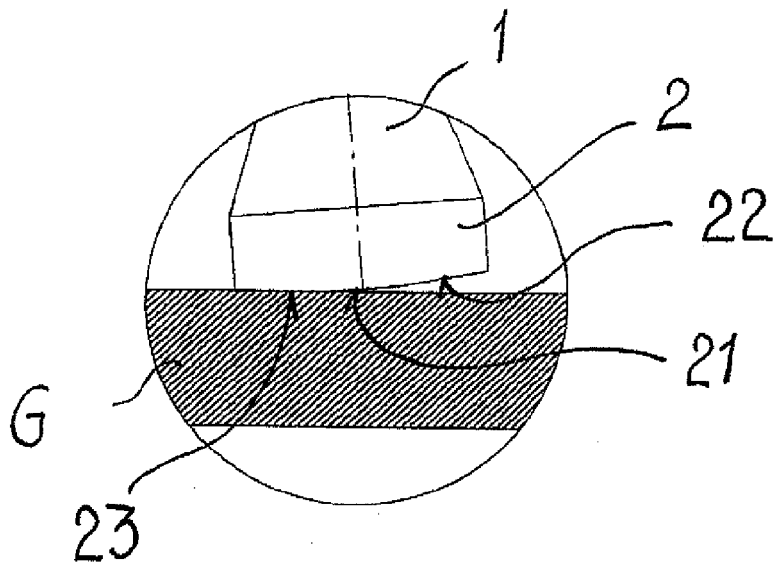
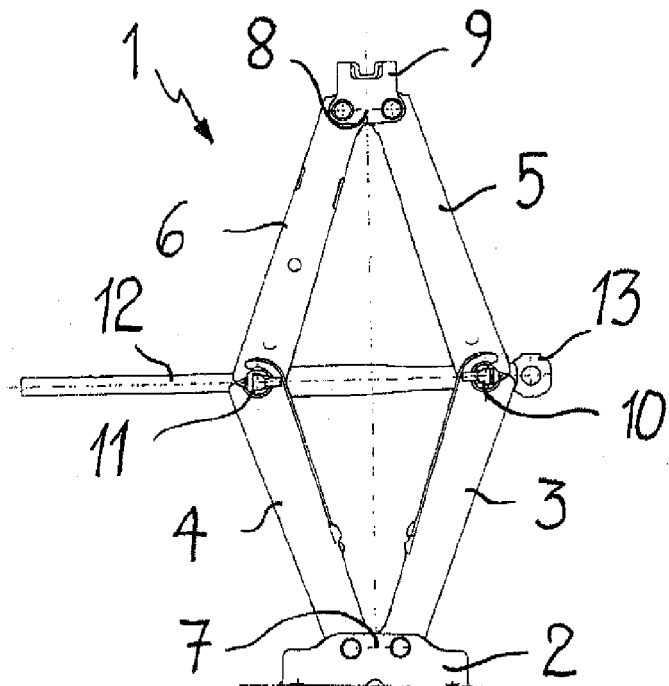
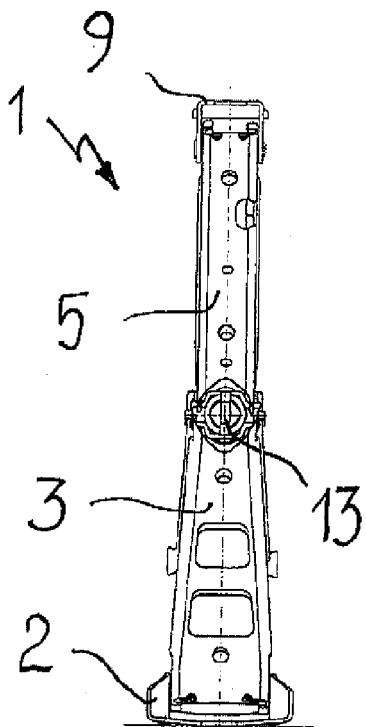
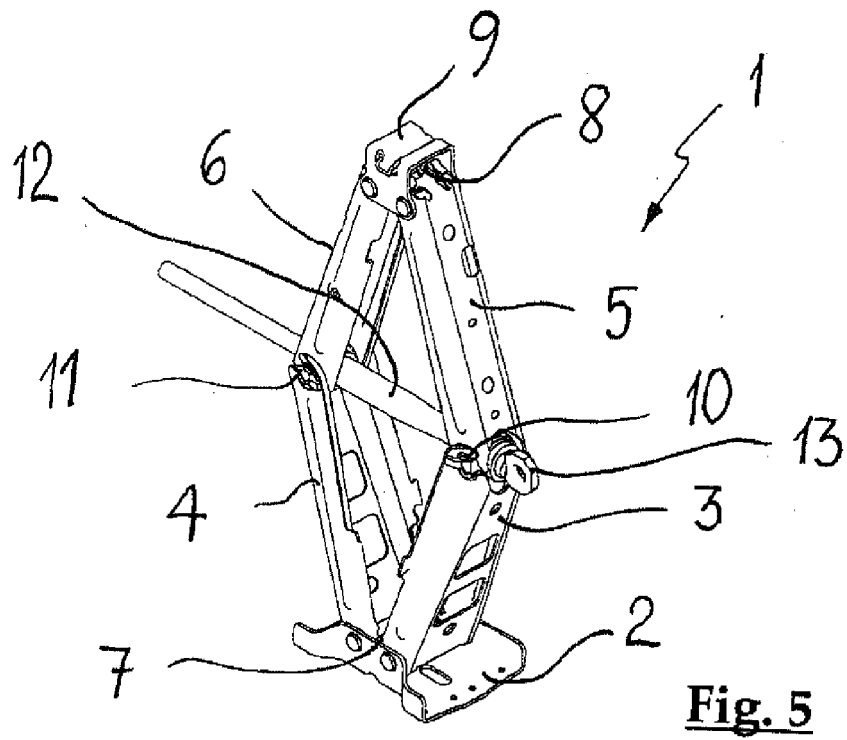
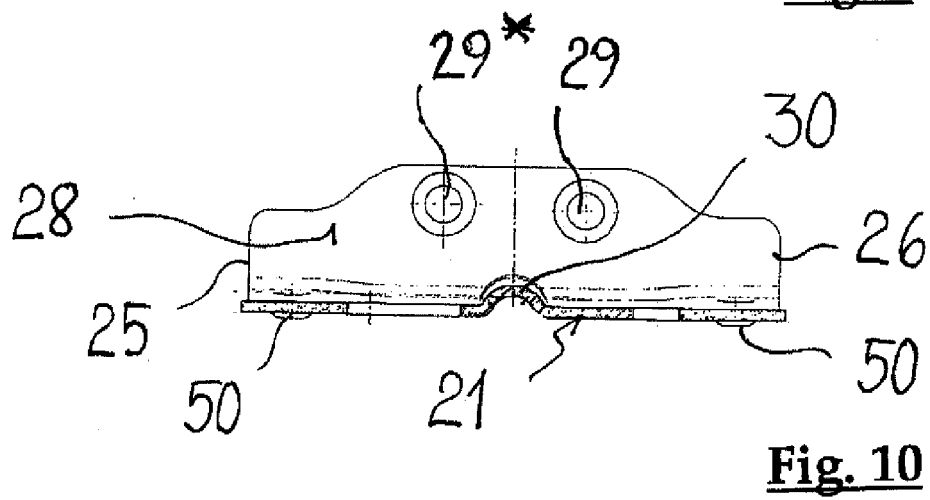
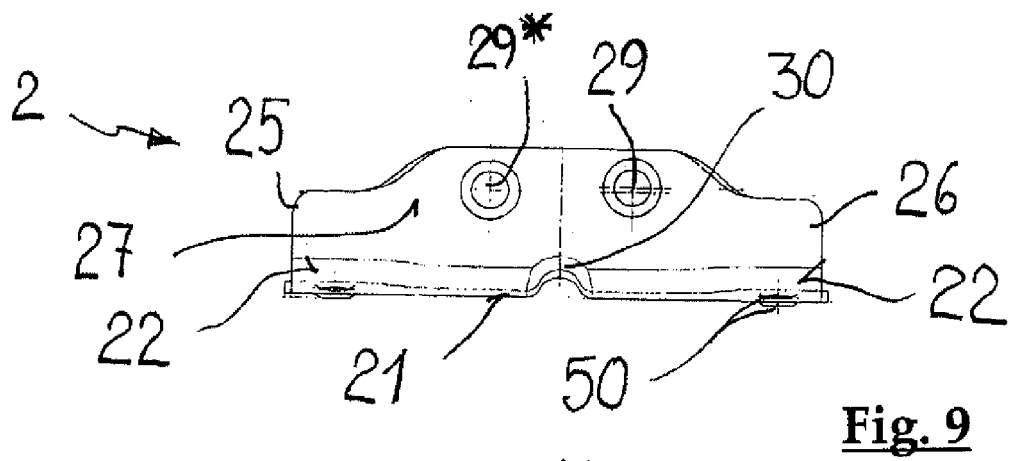
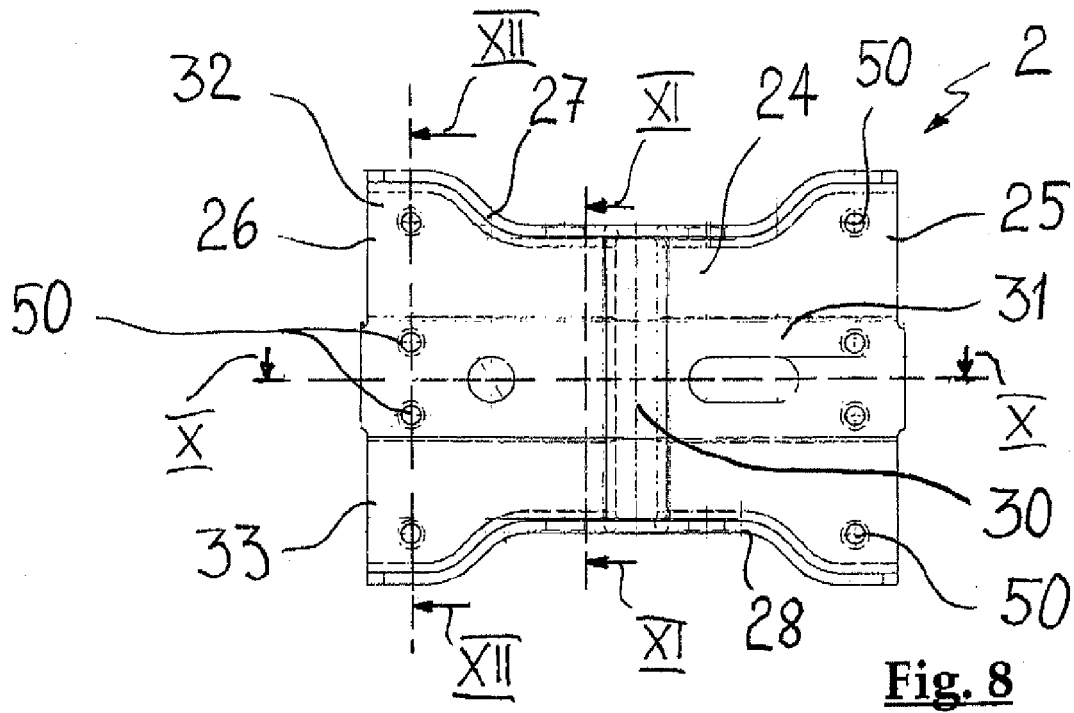
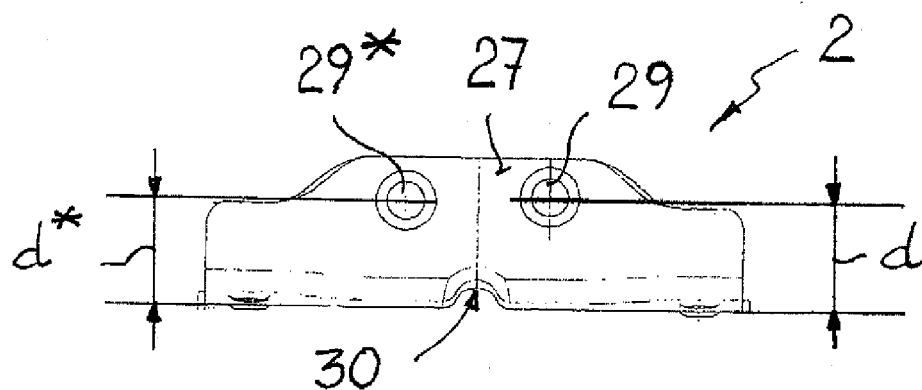
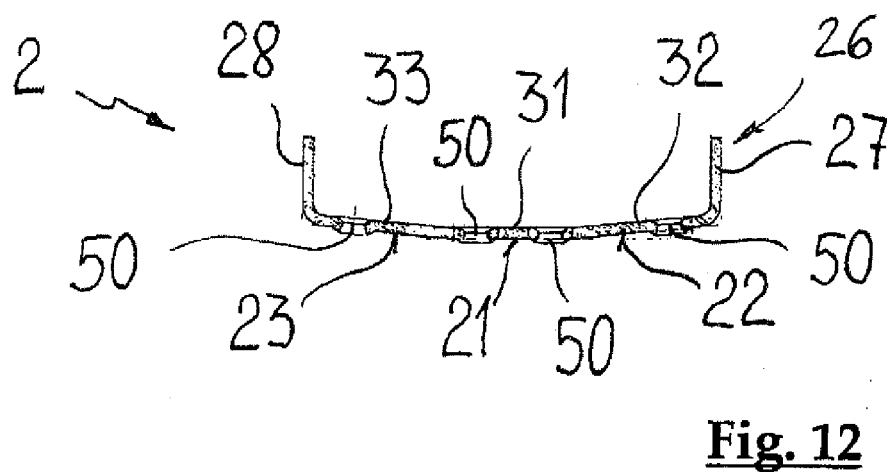
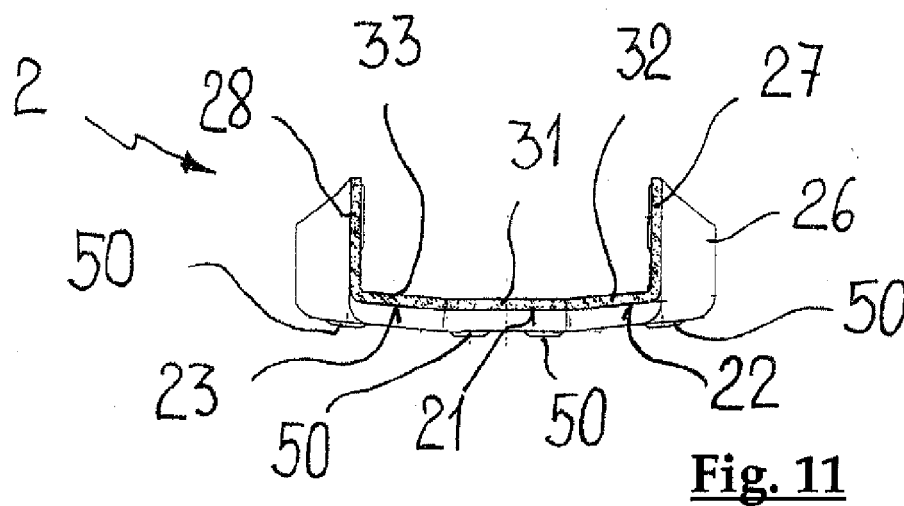


Fig. 4







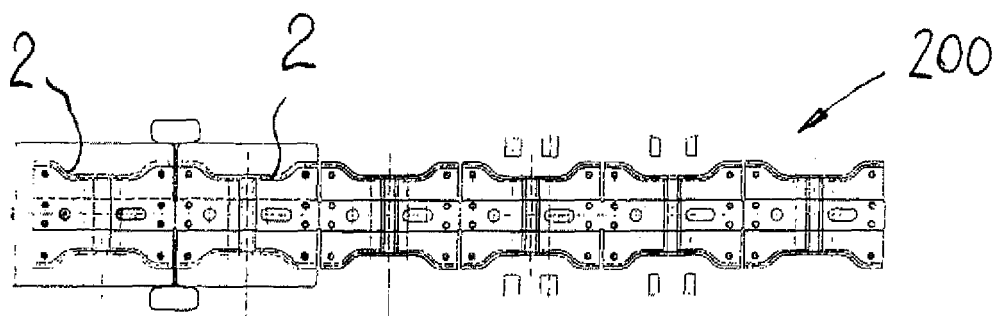
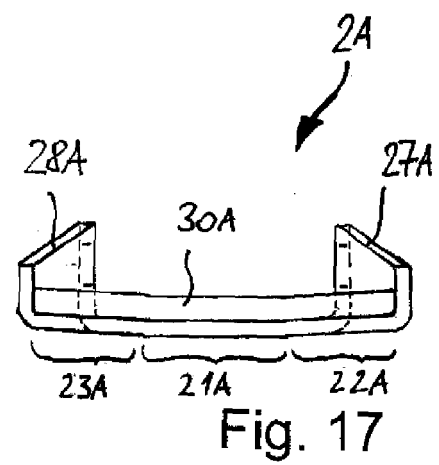
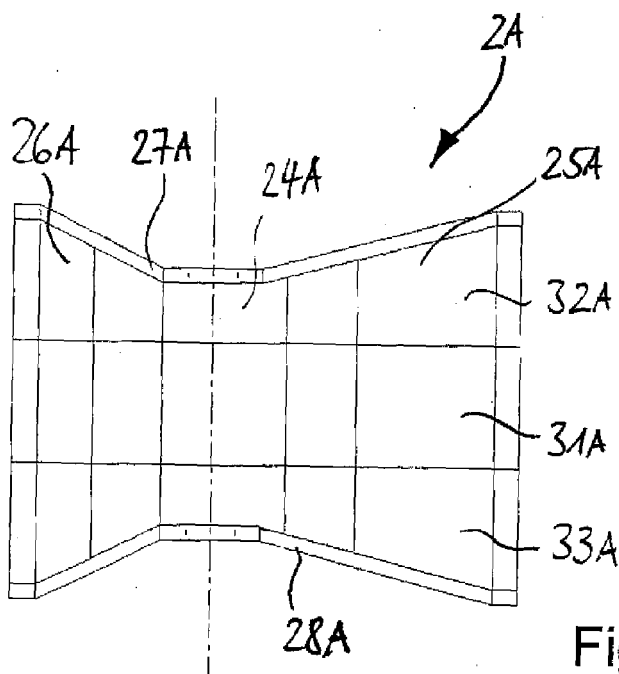
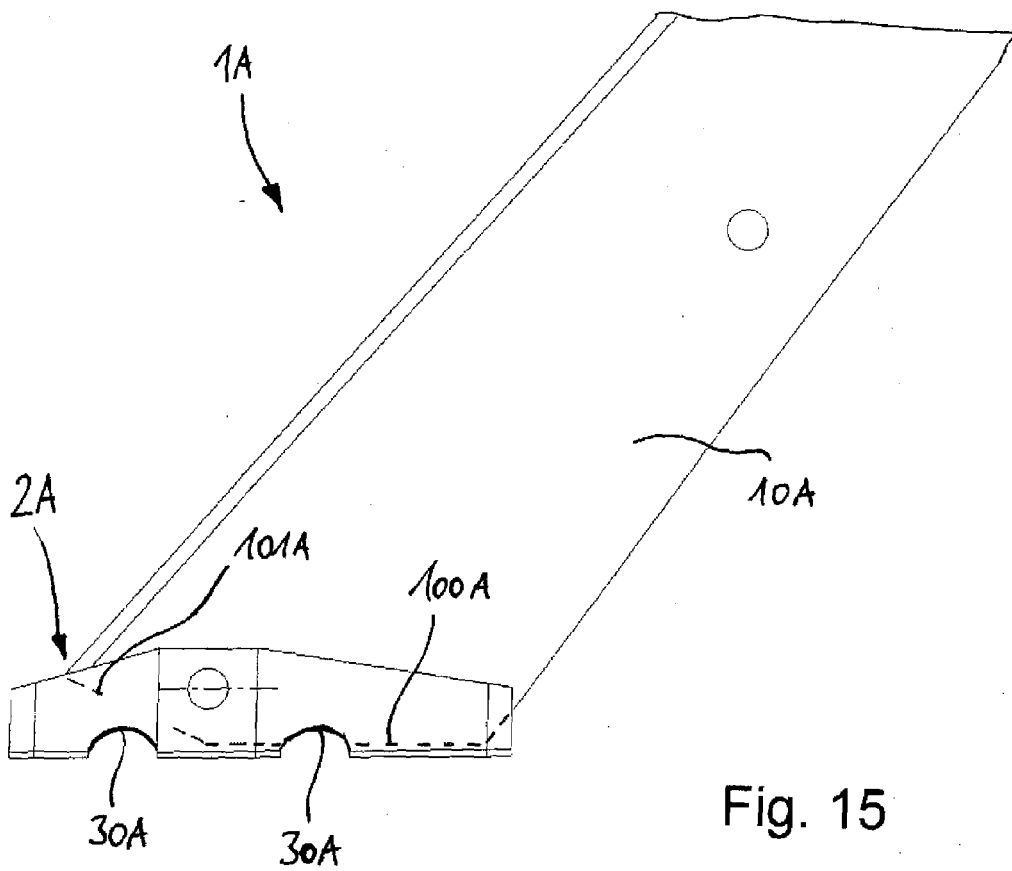


Fig. 14



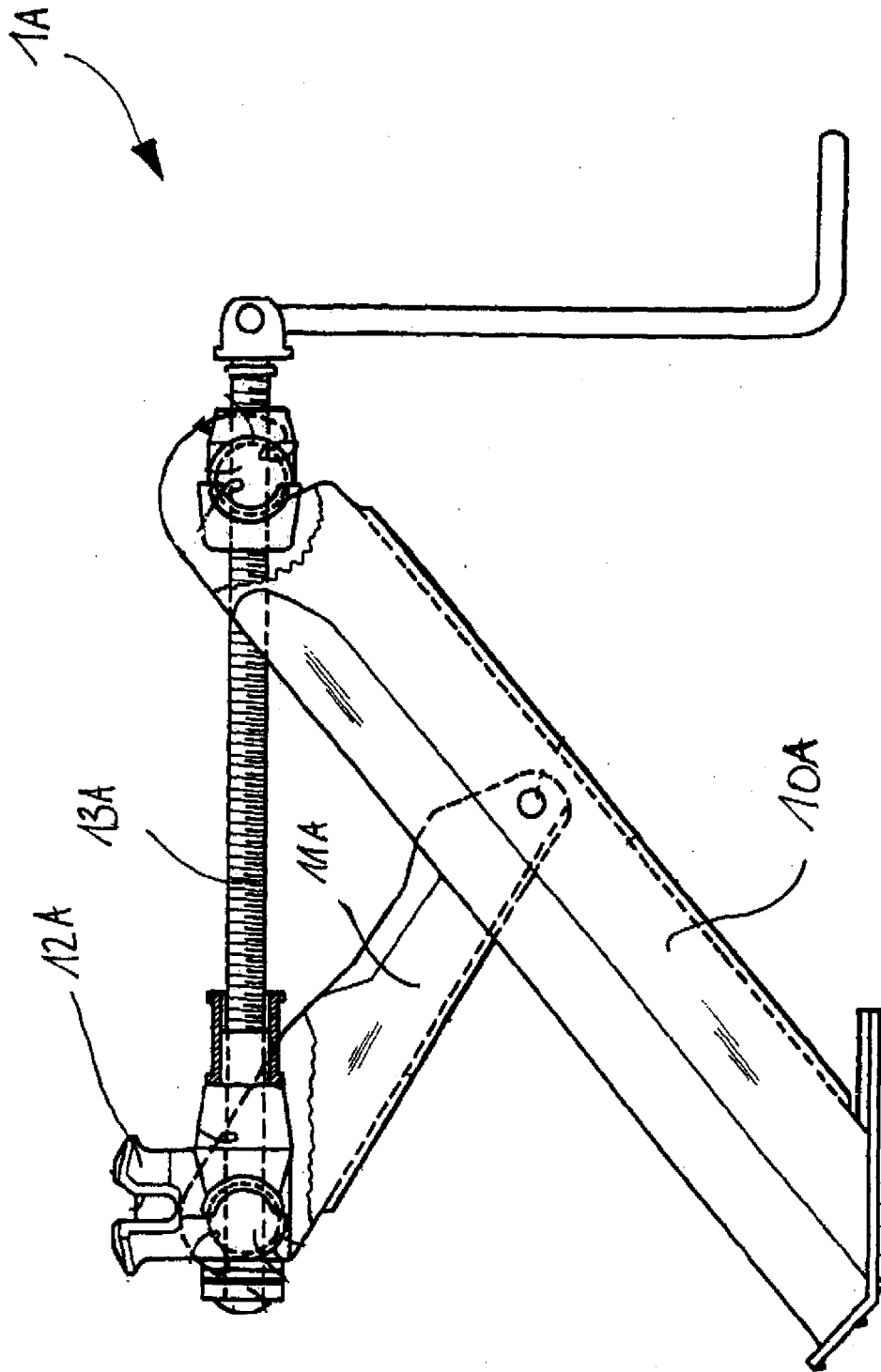


Fig. 18

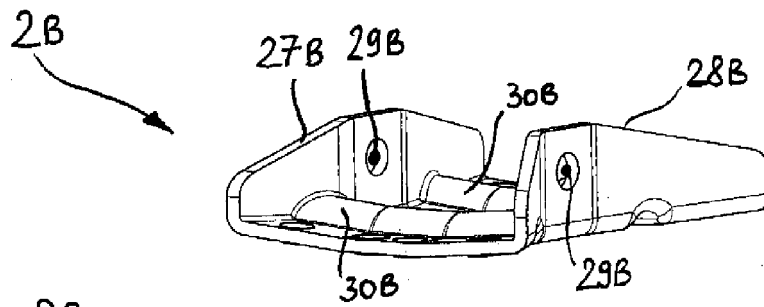


Fig. 19

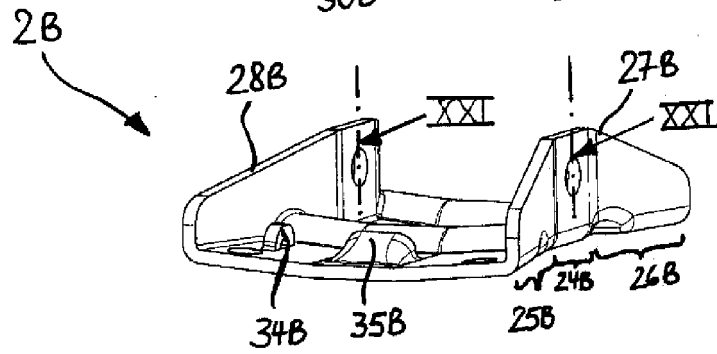


Fig. 20

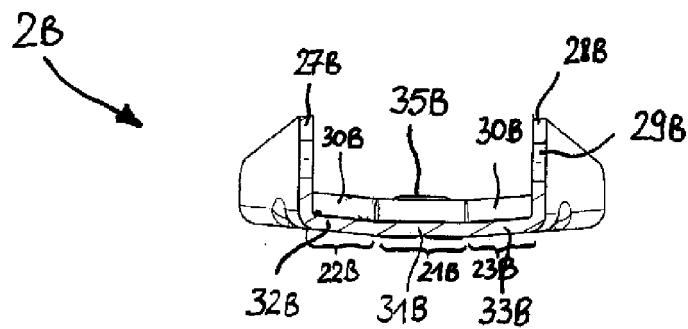


Fig. 21

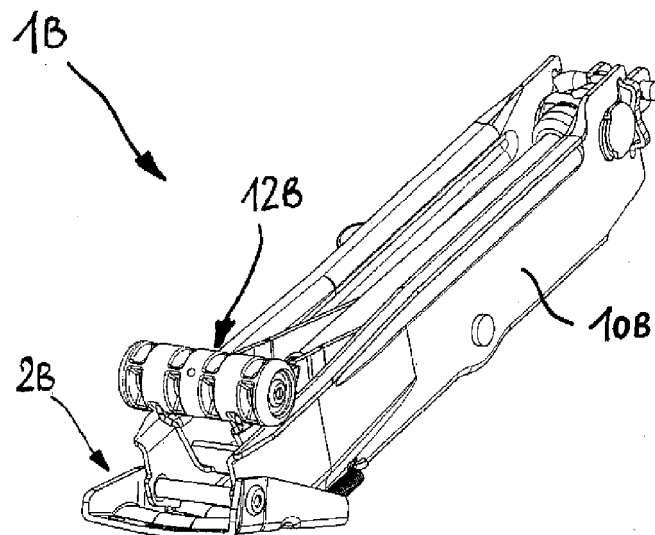


Fig. 22

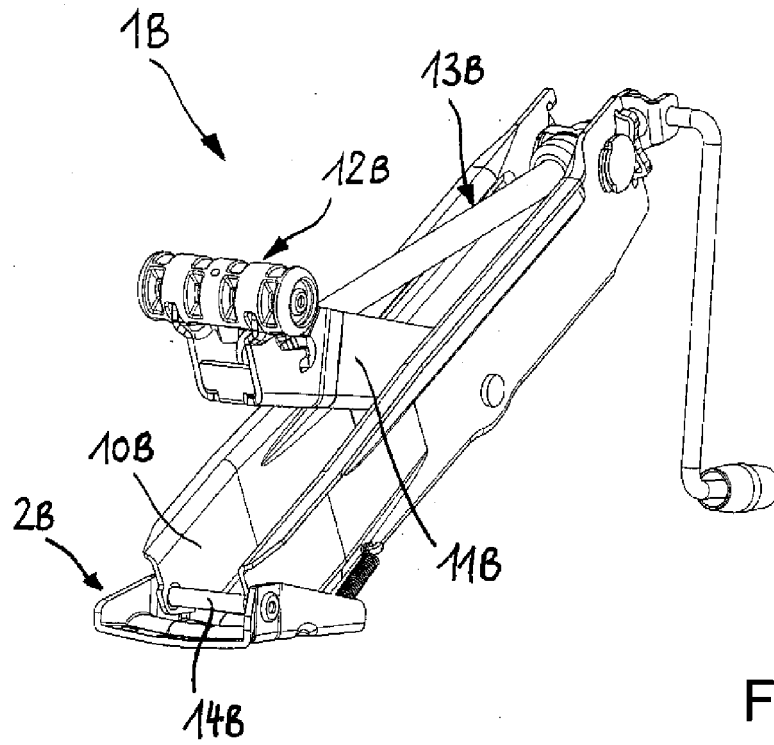


Fig. 23

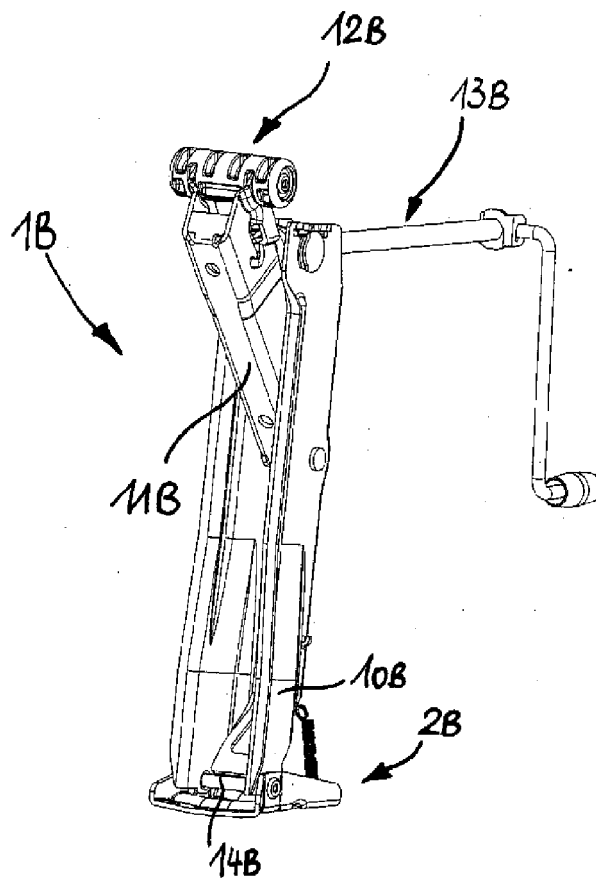


Fig. 24



EUROPEAN SEARCH REPORT

 Application Number
 EP 09 17 4843

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Place of search The Hague		Date of completion of the search 18 January 2010	Examiner Rupcic, Zoran
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