(19) Europäisches Patentamt
European Patent Office
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(11) **EP 3 228 424 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
11.10.2017 Bulletin 2017/41

(51) Int Cl.:
B25H 1/00 *(2006.01)*

(21) Application number: **17164479.2**

(22) Date of filing: **03.04.2017**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
MA MD

(30) Priority: **05.04.2016 IT UA20162300**

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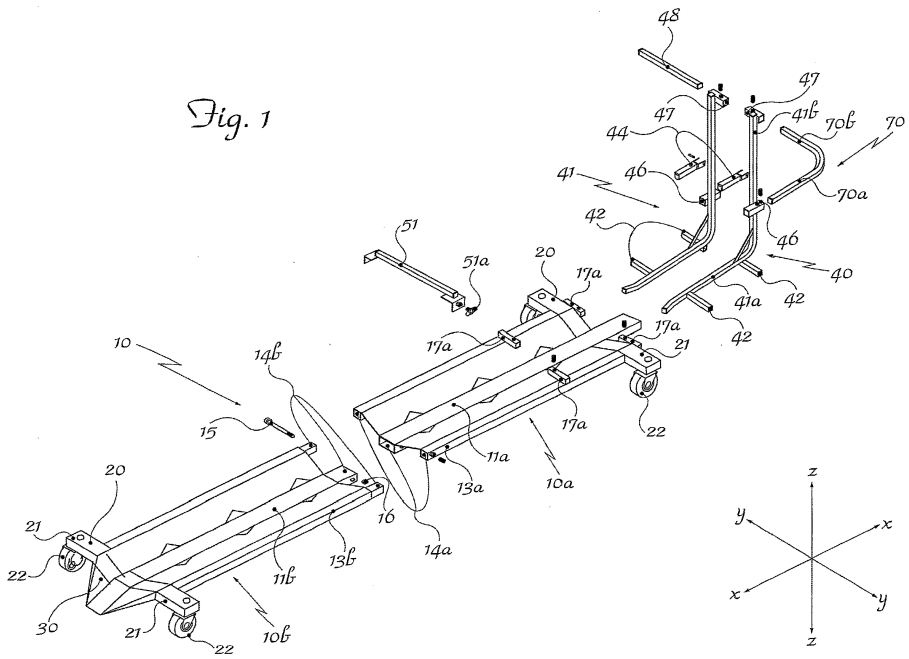
(54) **TROLLEY FOR SUPPORTING AND MOVING MOTORVEHICLES**

(57) Trolley for supporting and moving motorcycles, comprising a base (10) extending in a longitudinal direction (X-X) and divided along the longitudinal direction (X-X) into two half-bases (10a;10b), respectively a front half-base (10a) and a rear half-base (10b), the opposite, respectively front and rear, free ends of said half-bases (10a,10b) being fixed to a respective cross-piece (20) provided with swivel wheels (22); means (40) for guiding and retaining the front wheel (1) of the motorcycle, wherein said guiding and retaining means (40) comprise two first L-shaped bars (41) lying in a vertical plane (Z-X) and formed with a longitudinal arm (41a) and a vertical arm (41b); each longitudinal arm (41a) has a plurality of protrusions (42), situated opposite each other along a transverse widthwise direction (Y-Y) of the trolley, arranged at a predefined relative distance in the longitudinal direction (X-X) and designed to be inserted in corresponding transverse seats (17a) of the front half-base (10a), inside which they may be displaced so as to ensure the locked position, in the transverse direction (Y-Y), of the motorcycle wheel (1).

Fig. 1



EP 3 228 424 A1

Description

[0001] The present invention relates to a trolley for supporting and moving motorcycles.

[0002] It is known, in the technical sector of motorcycles, that difficulties exist with regard to parking these vehicles inside confined spaces, in fact although it may be possible to access such spaces with or without the motorcyclist sat on the saddle, it is then often not possible for the motorcyclist to dismount the motorcycle and lift it up onto the parking stand or in any case it may be very difficult to carry out this operation.

[0003] A typical example of this situation is the space alongside or behind a car which is parked inside a garage or closed space.

[0004] In addition to this problem, however, there is also the need to be able to move easily motorcycles in confined spaces in such a way that these movements may be performed also by users who are not tall in stature or by persons who have never moved/used motorcycles and in the easiest and safest possible manner. Such situations may arise, for example, inside private garages or in display rooms where the layout is to be modified or in repair workshops or in the pits used by racing teams.

[0005] IT MI2011A 1949, in the name of the same present Applicant, also discloses a trolley which provides a solution to the aforementioned problems of the prior art.

[0006] In practice, however, it has been established that this trolley also has drawbacks due to the excessive number of component parts which complicate assembly and adjustment of the front part for retaining the front wheel depending on the different types and diameters of the wheel.

[0007] GB 2 311 975 discloses a trolley according to the preamble of Claim 1.

[0008] The technical problem which is posed, therefore, is that of providing means for supporting and moving motorcycles which is able to allow access to confined spaces and may be used safely by users, including non-specialized users and be able to allow quick and easy manoeuvring and at the same time be able to be adapted easily and safely to the different configurations of the front wheels of the motorcycles so as to allow locking thereof, also irrespective as to the different forms of the mudguards.

[0009] In connection with this problem it is also required that this device should have small dimensions, be easy and inexpensive to produce and assemble, be low-weight and be able to be easily personalized by any user depending on the different requirements of the clients/users, and it should be able to be disassembled into a small number of parts in order to facilitate the transportation thereof by the same purchaser/user, including private purchasers/users, streamlining in any case transportation and storage for the dealers and thus reducing the packaging, storage and transportation costs.

[0010] These results are obtained according to the present invention by a trolley for supporting and moving motorcycles according to the characteristic features of Claim 1.

[0011] Further details may be obtained from the following description of a non-limiting example of embodiment of the subject of the present invention, provided with reference to the accompanying drawings, in which:

Figure 1: shows an exploded perspective view of the trolley according to the present invention;
Figure 2: shows a perspective view of the trolley according to Fig. 1 in the partially assembled condition;
Figure 3: shows a perspective view of the trolley according to the invention in the assembled condition;
Figure 4: shows a side view of the trolley according to the present invention in the assembled condition;
Figure 5: shows a top view of the trolley according to the invention in the assembled condition, and
Figure 6: shows a cross-section along the plane indicated by VI-VI in Fig. 5;

[0012] As shown in Fig. 1 and assuming solely for the sake of convenience of the description and without a limiting means a set of three reference axes in a longitudinal direction X-X, corresponding to the length of the trolley; transverse direction Y-Y, corresponding to the short widthwise side of the trolley; and vertical direction Z-Z, orthogonal to the other two directions, as well as a front part, corresponding to the means for steering the trolley, and a rear part, opposite to the front part, a trolley according to the present invention comprises substantially:

-) a support base 10, preferably comprising a front half-base 10a and a rear half-base 10b;

each half-base 10a,10b of the base 10 has a respective central, axial, longitudinal member 11a,11b on which the vertex of a respective plate 12a,12b shaped substantially in the form of an open V with a wide obtuse angle is mounted; the opposite longitudinal edges of the plates 12a, 12b are folded over several times downwards so as to form a hollow square-shaped finishing element 13a,13b.

[0013] According to the invention it is envisaged that the rear facing ends 14a of the longitudinal member 11a and of the two opposite longitudinal edges 12a of the plate of the front half-base 10a are hollow and that the respective front facing ends 14b of the longitudinal member 11b and of the two opposite longitudinal edges 12b of the plate of the rear half-base 10b have a male form suitable for engagement with the corresponding hollow end of the said rear facing ends of the front half-base 10a.

[0014] Although engagement may be performed by means a friction force-fit, a preferred embodiment for locking together the two ends of the half-bases 10a,10b comprises a transverse bolt 15 of suitable length which, once the half-bases have been assembled, may be inserted inside corresponding transverse holes of the longitudinal members 11a,11b, so as to emerge on the op-

posite side for locking by means of an associated nut 16 and also for allowing locking together of the two upper, square-shaped, longitudinal ends 14a,14b by means of two screws/dowel pins (not shown).

[0015] The opposite, respectively front and rear, free ends of the half-bases 10a,10b are respectively fixed to a cross-piece 20 (Fig. 6) shaped with the same open V form as the plate of the respective half-base 10a,10b and having flanges 21 projecting outwards in the transverse direction Y-Y; said flanges 21 having, mounted thereon, swivel wheels 22 for the movement of the trolley. Preferably the wheels can be locked by means of braking elements (not shown).

[0016] The cross-piece 20 of the rear part of the trolley is fixed to a slide 30 for facilitating mounting/removal of the motorcycle onto/from the base 10.

[0017] The slide 30 is shown as being fixed, but an embodiment may be provided where it is able to rotate about a transverse axis (schematically shown in broken lines in Fig. 2) from a position swung down onto the ground, substantially parallel to the longitudinal direction X-X, into a raised position substantially parallel to the vertical direction Z-Z, there being also provided means (not shown) for locking the slide in the two positions. The rotation may be performed for example by means of one or more hinges. In the raised position, the slide 30 may act as a rear stop for the rear wheel of the motorcycle.

[0018] In addition to the above, it is envisaged that the fixed slide 30 may be slightly raised from the ground and can be associated with a mobile add-on (mountable/removable) extension 130 - shown in broken lines in Fig. 3 - which is up to 90 cm in length and rests on the ground, said extension being hooked onto the rear half-base 10b so as to allow easy access onto the trolley also of motorcycles which have engine or bodywork parts very close to the ground.

[0019] In detail:

- the guiding means 40 comprise two first L-shaped bars 41 lying in a vertical place Z-X and formed by a longitudinal arm 41a and a vertical arm 41b;

each longitudinal arm 41a has a plurality of protrusions 42, two in the example, situated opposite each other in the transverse direction Y-Y and arranged at a predefined relative distance in the longitudinal direction X-X; the protrusions are able to be inserted in corresponding transverse seats 17a of the front half-base 10a, inside which they may be displaced so to ensure the locked position, in the transverse direction Y-Y, of the motorcycle wheel 1 (Fig. 5); preferably the joint is stabilized by means of conventional screws/dowel pins which cooperate with a respective nut welded onto the transverse seats 17a;
in its front part (Fig. 5), the trolley has means 40 for locking the front wheel 1 of the motorcycle; preferably orthogonal cross-pieces 44 are also provided, these being respectively slidable in both senses of the vertical direction (Z-Z) on the vertical arm 41b of each first L-shaped bar and being able to be fixed in the most suitable position for providing an additional lateral support element for the front wheel - end-of-travel means 70 in the form of a second L lying in a horizontal plane X-Y and formed by a longitudinal arm 70a and a transverse arm 70b; the longitudinal arm 70a is designed for insertion inside the first, longitudinal, square-shaped elements 46 so as to arrange the transverse arm 70b in a position such as to form a front end-of-travel stop member for the motorcycle wheel. According to the invention it is also envisaged that the vertical arms 41b of the two first end-of-travel L-shaped 40 members are connected by a cross-piece 48 designed to be inserted inside the second transverse square-shaped elements 47 so as to form the element for gripping and steering of the trolley by the user.

[0020] All the joints may be stabilized by means of a friction interference fit or screw means which are conventional per se, such as nuts welded onto the longitudinal and transverse square-shaped elements 46 and 47 with which screws/dowel pins cooperate.

[0021] According to a preferred embodiment, transverse means 50 for locking the front wheel 1 in the vertical direction Z-Z may be provided, said means comprising a cross-piece 51 which is inserted behind the said wheel and can be fastened to the longitudinal member 11a of the front half-base 10a using wing-nut screw means 52 (Fig. 5).

[0022] With reference to this configuration the operating principle of the trolley is as follows:

- after assembling the trolley, joining the two half-bases 10a,10b together in the longitudinal direction and provisionally positioning the guiding means 40 according to the width of the front tyre 1 of the motorcycle, the trolley is moved into the position for receiving the motorcycle, the wheels 22 are locked using the respective brake, the slide 30 (if rotatable) is rotated downwards and locked using the associated means (not shown) or the additional extension is hooked up if required by the characteristics of the motorcycle;
- the motorcycle is loaded onto the base 10 until the front wheel enters into the guiding means 40, coming to a rest against the front wheel stop 70;
- the guiding means 40 are regulated so as to adjust their definitive position in the transverse direction so that the front wheel of the motorcycle is inserted correctly in the transverse direction between the two first L-shaped members 41;
- the first L-shaped members are fixed precisely in position by means of the associated locking means;
- the respective lateral supports 44, which are slidable in the vertical direction Z-Z, are also adjusted with precision and fixed in the most suitable position on the parts 41b of the two first L-shaped members 40,41;
- the longitudinal position of the second end-of-travel L member in the longitudinal direction X-X is adjusted

with precision, locking it using the associated screw means;

- in order to prevent any movement of the motorcycle in the longitudinal direction X-X (i.e. backwards) a cross-piece 51 sliding on the square-shaped edges 13a,13b of the V-shaped plate is provided so that it bears against the rear part of the front wheel and is locked there by means of wing-nut screw means 52, thus preventing any reverse movement of the motorcycle (Fig. 5) ;
- the parking brake is released, so that the trolley is free to perform the required movements;
- when the parking position is reached, the brakes of the wheels 22 are operated again so as to lock the trolley in position.

[0023] It is therefore clear how the trolley according to the invention is particularly effective for supporting and moving a motorcycle and the like, being at the same time extremely light, manageable and composed of a small number of parts which can be disassembled and reassembled in order to minimize the dimensions and the packaging, storage and transportation costs.

[0024] The adjustable device for locking the front wheel therefore makes the trolley particularly versatile and adaptable with ease and quickly to the different configurations of the front wheels of the motorcycles, whether they be motorcycles or scooters, with or without wheel-covering mudguards and the like.

[0025] In addition, the device for locking the wheels of the vehicle and the entire trolley for the necessary loading/unloading and passive parking operations makes the trolley particularly safe and suitable for use also by non-specialized users.

[0026] Although described in connection with a number of embodiments and a number of preferred examples of embodiment of the invention, it is understood that the scope of protection of the present patent is determined solely by the claims below.

Claims

1. Trolley for supporting and moving motorcycles, comprising a base (10) extending in a longitudinal direction (X-X) and divided along the longitudinal direction (X-X) into two half-bases (10a;10b), respectively a front half-base (10a) and a rear half-base (10b), the opposite, respectively front and rear, free ends of said half-bases being fixed to a respective cross-piece (20) provided with swivel wheels (22) ;
means (40) for guiding and retaining the front wheel (1) of the motorcycle,
characterized in that:

said guiding and retaining means (40) comprise two first L-shaped bars (41) lying in a vertical plane (Z-X) and formed with a longitudinal arm (41a) and a vertical arm (41b);
each longitudinal arm (41a) has a plurality of protrusions (42), situated opposite each other along a transverse widthwise direction (Y-Y) of the trolley, arranged at a predefined relative distance in the longitudinal direction (X-X) and designed to be inserted in corresponding transverse seats (17a) of the front half-base (10a), inside which they may be displaced so as to ensure the locked position, in the transverse direction (Y-Y), of the motorcycle wheel (1).

2. Trolley according to Claim 1, **characterized in that** each half-base (10a,10b) of the base (10) has a respective central, axial, longitudinal member (11a,11b) on which a respective plate (12a,12b) shaped substantially in the form of an open V with a wide obtuse angle is mounted; the opposite longitudinal edges of the plates (12a,12b) being folded over several times downwards so as to form a hollow square-shaped finishing element (13a,13b).

3. Trolley according to Claim 2, **characterized in that** the rear-facing ends (14a) of the front longitudinal member (11a) and of the two opposite longitudinal edges (12a) of the front half-base (10a) are hollow and the respective front-facing ends (14b) of the longitudinal member (11b) and of the two opposite longitudinal edges (12b) of the rear half-base (10b) have a male form suitable for engagement with the corresponding hollow end of the said rear-facing ends of the front half-base (10a).

4. Trolley according to any one of the preceding claims, **characterized in that** the vertical arm (41b) of each first L-shaped bar (41) has first, longitudinal, hollow, square-shaped elements (46) arranged at a substantially middle height and second, hollow, transverse, square-shaped elements (47) arranged at the free end of the vertical arm (41b).

5. Trolley according to either one of Claims 2 or 3, **characterized in that** each first L-shaped bar comprises a cross-piece (44) slidable on the vertical branch (41b) of the respective first L-shaped bar in both senses of the vertical direction (Z-Z) and able to be fixed in the most suitable position for providing an additional lateral support element for the front wheel.

6. Trolley according to either one of Claims 4 or 5, **characterized in that** it comprises end-of-travel means (70) in the form of a second L lying in a horizontal plane (X-Y) and formed with a longitudinal arm (70a) and a transverse arm (70b); the longitudinal arm (70a) being designed to be inserted inside the said first, longitudinal, square-shaped elements (46) of the guiding means so as to position the transverse arm (70b) longitudinally so as to form a front end-of-

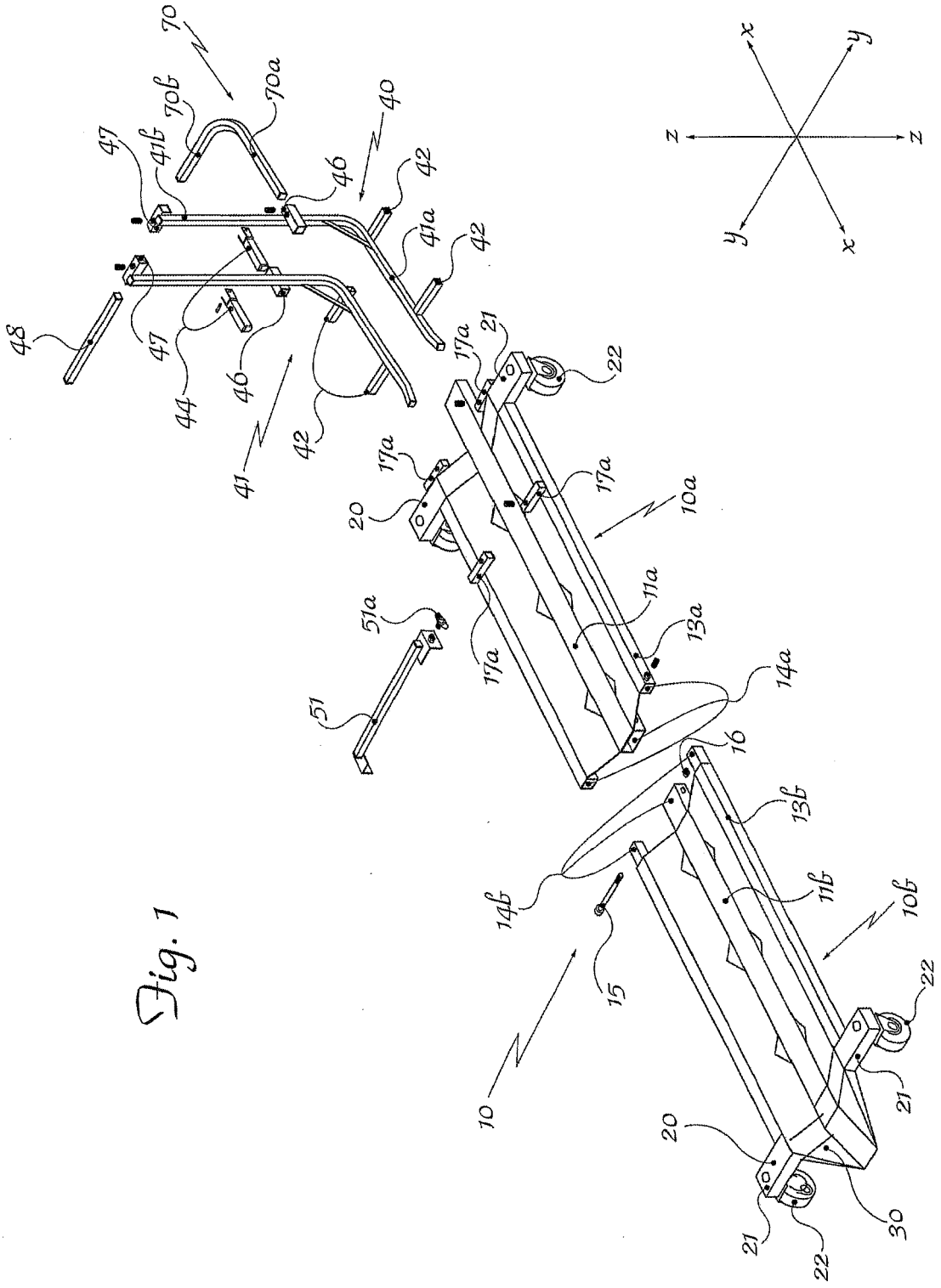
travel stop element for the motorcycle wheel.

7. Trolley according to any one of Claims 4 to 6, **characterized in that** it comprises a cross-piece (48) designed to be inserted inside the second transverse square-shaped elements (47) on the vertical arms (41b) of the two first L-shaped bars of the guiding means (40) so as to form a trolley gripping and manoeuvring element for the user.

8. Trolley according to any one of the preceding claims, **characterized in that** it comprises transverse means (50) for performing locking of the front wheel (1) in the longitudinal direction (X-X), said means comprising a cross-piece (51) slidable along the two square-shaped edges of the V plate (13a,13b) of the front half-base and able to be fastened by wing-nut screw means (52) in the desired position once in contact with the rear part of the front wheel of the motorcycle.

9. Trolley according to any one of the preceding claims, **characterized in that** it comprises a fixed ramp arranged slightly raised from the ground and integral with the rear half-base (10b), for entry and exit of a motorcycle onto/from the trolley.

10. Trolley according to any one of the preceding claims, **characterized in that** it comprises a mobile extension which can be hooked onto the rear base (10b) for extending the rear slide (30).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70a
70b
40
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41b
46
42
41a
48
44
41
10a
10b
10
11a
11b
13a
13b
14a
14b
16
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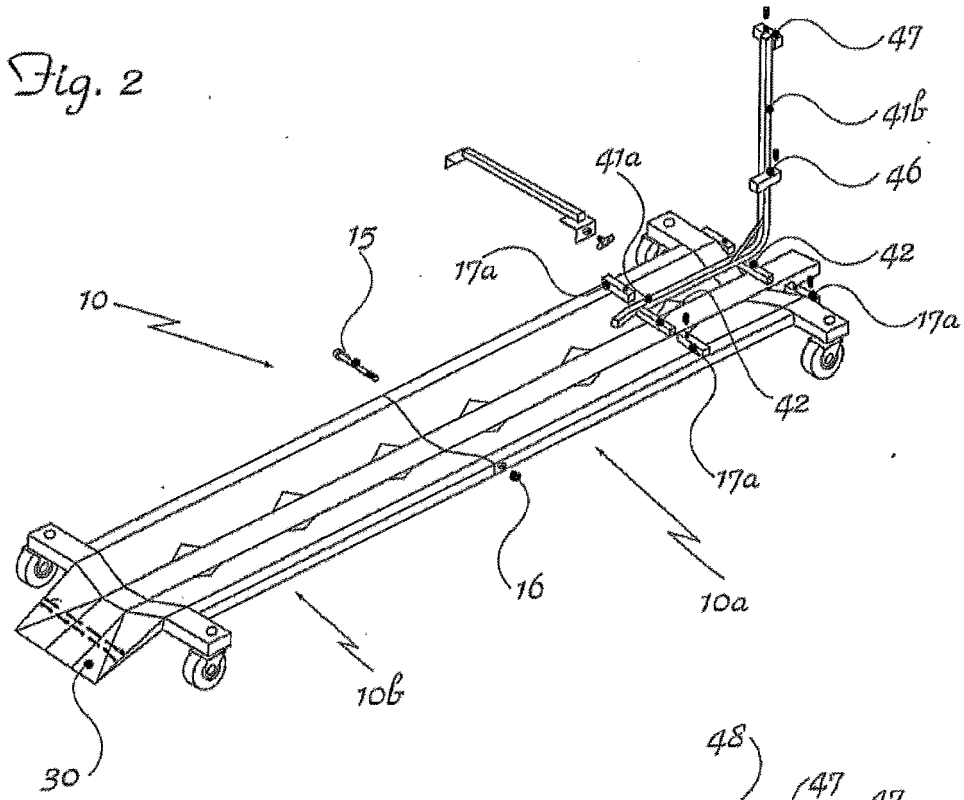
17a
20
21
22
51
51a
30
x
y
z

Fig. 1

Fig. 2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17a
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17a
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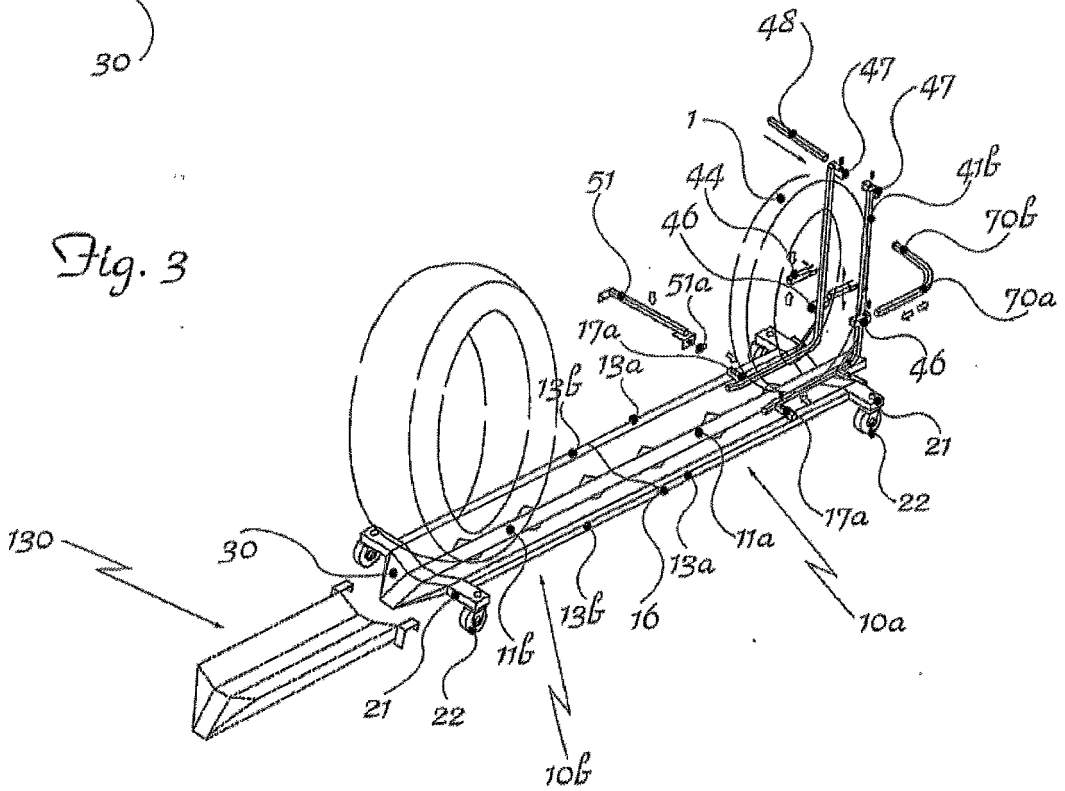
30

Fig. 3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41b
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70b
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70a
17a
46
13a
13b
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13b
16
10a
11b
21
22
10b

Fig. 4

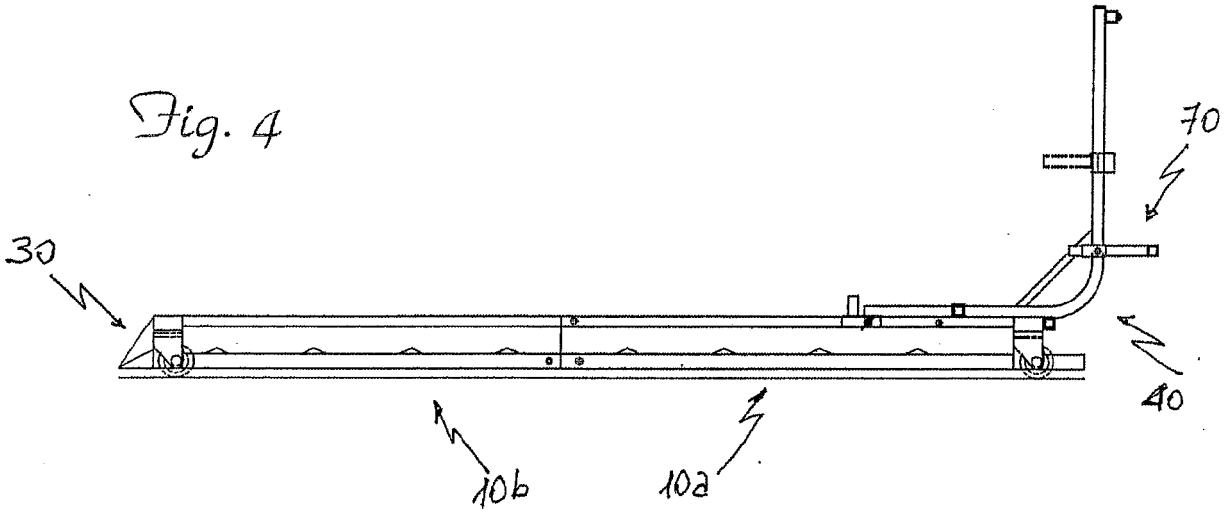


Fig. 5

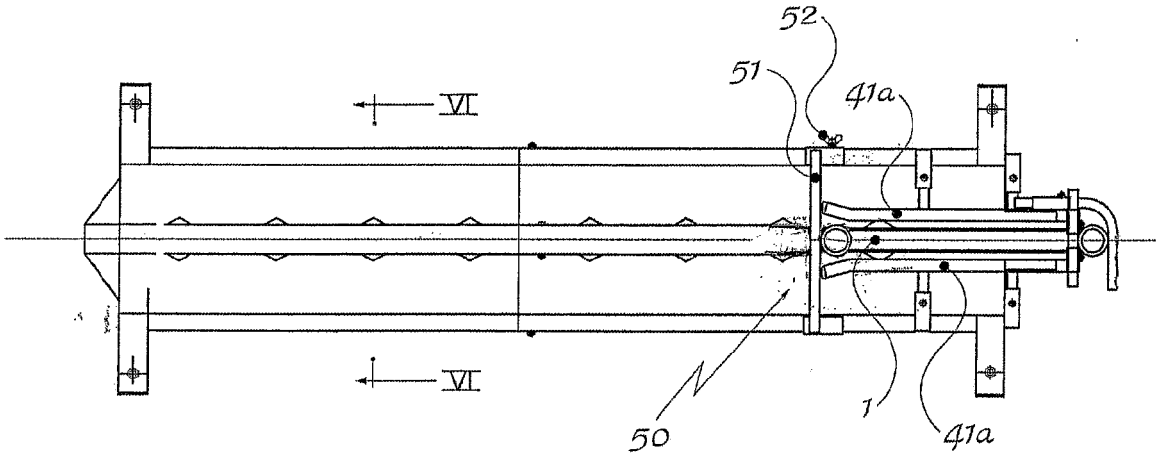
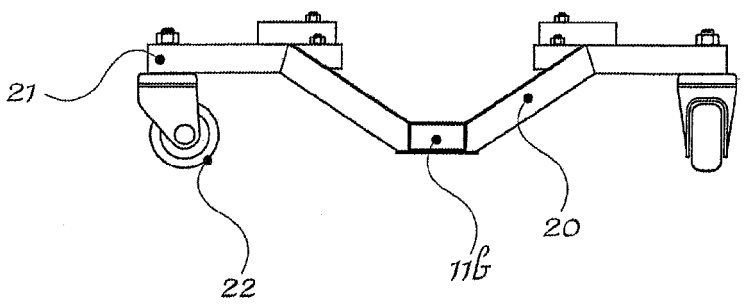


Fig. 6



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EUROPEAN SEARCH REPORT

Application Number
EP 17 16 4479

DOCUMENTS CONSIDERED TO BE RELEVANT

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A	EP 1 918 183 A2 (BORLA AMBROGIO [IT]) 7 May 2008 (2008-05-07) * paragraphs [0014] - [0037]; figures *	1-10	
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	25 July 2017	David, Radu

CATEGORY OF CITED DOCUMENTS

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