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(54) Supporting device for facilitating a working activity in a knelt down position

(57) Supporting device 10 for facilitating a working activity in particular in a knelt down position, the supporting device 10 comprises a frame 20 preferably metallic and a plurality of wheels hinged to said frame 20.

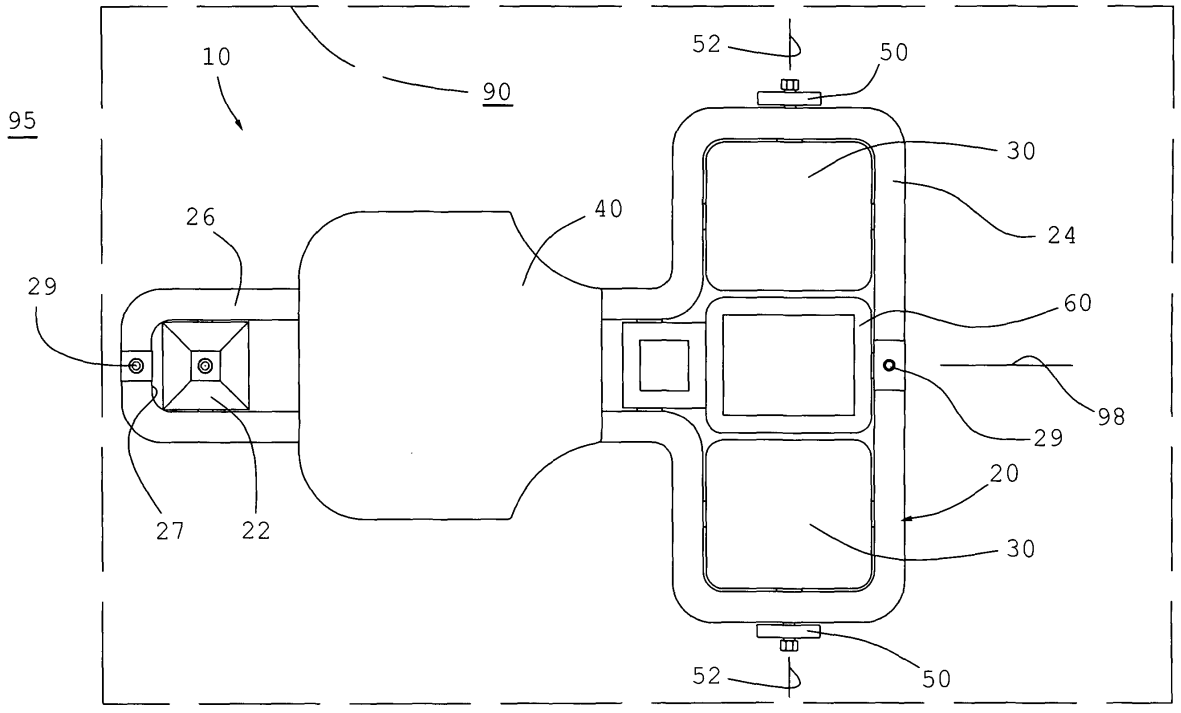
Supporting device 10 comprising at least a knees supporting portion 30 constrain and/or made integral to said frame 20.

The frame 20 preferably tubular metallic results substantially "T" shake and it is preferably realized in just one piece in a polymeric material or in a metallic material preferably tubular in a way to follow preferably an external profile preferably of a "T".

In particular said metallic frame 20 is realized through two tubular elements each of which follow an external profile of an half "T", which are made integral in just one piece or constrain through correspondent screws 29.

The plurality of wheels 50 comprises three wheels 50 of which at least a wheel 54 pivotable.

FIG. 1



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Description

[0001] The present invention refers to a supporting device for facilitate a working activity in a knelt down position.

[0002] Presently in the mechanic field exist beds provided with wheels which permit to work under a car.

[0003] Besides there are little working chairs provided with wheels which permit to seat and make some operations in particular on the cars.

[0004] Both do not permit to make a working activity on a knelt down position.

[0005] Today there are much working activity, in particular in the mechanic field, in which it is frequently necessary to operate in a knelt down position for a long time, and work in this position often cause fatigue and pain.

[0006] Purpose of the present invention it is to realize a supporting device for facilitate a working activity in particular in a knelt down position which permit to an user to pass easily and quickly from a stand up position to said knelt down position and vice versa, and that at the same time permit to avoid instability and rotations of the same supporting device during the passage from a position to the other.

[0007] Another purpose is to realize a supporting device for facilitate a working activity in particular in a knelt down position which should be stable and that permit to an user to maintain the same position and the same freedom of movement as if the supporting device were not present.

[0008] Still another purpose is to have a supporting device for facilitate a working activity in particular in a knelt down position that permit to an user to easily get down on his knees and to agilely move himself maintaining said knelt down position.

[0009] Still another purpose is that to have a supporting device for facilitate a working activity in particular in a knelt down position that should be not cumbersome and that should be easy to transport.

[0010] Further purpose is that to have a supporting device for facilitate a working activity in particular in a knelt down position that can be easy to realize and easy to assemble.

[0011] These purposes according to the present invention are reached realizing a supporting device for facilitate a working activity in particular in a knelt down position according to claim 1.

[0012] Further features of the invention are pointed out in the following claims.

[0013] The features and the advantages of a supporting device for facilitate a working activity in particular in a knelt down position according to the present invention will appear more evident from the following illustrative and not limitative description, referred to the attached schematic drawings in which:

figure 1 is a schematic basal top view of a preferred form of embodiment of a supporting device for a working activity according to the present invention.

figure 2 is a basal schematic bottom view of the supporting device of figure 1;

figure 3 is a raised frontal schematic rear view of a preferred form of embodiment of a supporting device for a working activity according to the present invention;

figure 4 is a raised frontal partially sectioned rear view of the supporting device of figure 3;

figure 5 is a raised lateral left partially sectioned view of the supporting device of figure 3.

[0014] With reference to the figures, it is shown a supporting device 10 for facilitate a working activity in a knelt down position.

[0015] Preferably said working activity is in particular a repairing or changing or service operation of a car, and/or an hydraulic and/or electrical operation and/or their similar.

[0016] Said supporting device 10 comprises a substantially planar frame 20 and a plurality of wheels 50 hinged to said frame 20.

[0017] According to the present invention said supporting device 10 comprises at least a knees supporting portion 30 constrained or made integral to said frame 20 and besides said plurality of wheels 50 comprises at least a pivotable wheel 54.

[0018] In particular said at least a knees supporting portion 30 is constrained to said frame 20 through fixing means preferably releasable, and in particular adjustable, not shown.

[0019] Preferably each wheel of said plurality of wheels 50 shows a rotation axis 52 which lie substantially in a barycentric plane 90 of said frame 20.

[0020] In particular with reference to the figures 4 and 5, said plurality of wheels 50 comprises a plurality of wheels with fixed rotation axis 50, preferably two, which are directly laterally hinged to an external perimeter of said substantially planar frame 20 in such a way to lower the barycentre of said frame 20 substantially at the same height of the barycentre of each wheel 50.

[0021] Practically this eliminate the possibility to have a rotation of the frame 20 respect to a plane 95, because a force applied to the same and having a direction that is inclined respect to said barycentric plane 90 of said frame 20 would determine simply the transfer of a rotatory moment directly to the wheels 50, consequently determining a pure translation of the frame 20.

[0022] Preferably said barycentric plane 90 is distant less than 8 cm from a floor 95 and in particular it is distant less than 5 cm from the same.

[0023] Besides the consequent extreme proximity to a floor 95, permit to pass with just one movement from a position with the knees leaning to said at least a knees supporting portion 30 to a knelt down position with the weight completely supported by feet, in the case in which it would be necessary to exercise a greater force.

[0024] Preferably said supporting device 10 comprises

at least an housing portion 22 of said at least a pivotable wheel 54 which is constrained and/or made integral to said frame 20.

[0025] Said at least an housing portion 22 extends upperly to said substantially planar frame 20 in such a way to make result substantially in said barycentric plane 90 a principal rotation axis 56 of said at least a pivotable wheel 54.

[0026] Advantageously in this way it is possible to move easily and agilely said supporting device 10 maintaining said knelt down position.

[0027] According to a preferred form of embodiment said plurality of wheels 50 comprises three wheels 50 of which at least one is a pivotable wheel 54.

[0028] Advantageously in this way it is obtained a supporting device 10 much stable because it having three wheels 50, contemporaneously all the wheels rest to the floor 95 also when said floor 95 do not results planar, and consequently said supporting device 10 can not wobble or oscillate.

[0029] Besides this permit to reduce at the minimum the number of wheels of said supporting device 10 and also the total number of components.

[0030] Preferably said plurality of wheels 50 comprises three wheels 50 of which a rotatable wheel 54, and two wheels 50 with fixed rotation axis preferably directly hinged to the external perimeter of said frame 20 in a substantially symmetric way respect to a longitudinal axis 98.

[0031] In particular said substantially planar frame 20 results substantially shaped as "T" or as "Y" in such a way to permit an easy approach with the feet to said at least a knees supporting portion 30 and in a way to facilitate the movement through at least a foot of said supporting device 10 also when an user results knelt down with the knees leaning to said at least a knees supporting portion 30.

[0032] In particular said frame 20 results substantially "T" shaped and it is realized preferably in just one piece.

[0033] Advantageously this permit an easy approach to said at least a a knees supporting portion 30 and besides permit to reduce the components number and the device cost.

[0034] In particular said frame 20 preferably metallic comprises a first portion 24 and a second portion 26 which extends starting from a substantially central lateral zone of said first portion 24 in a direction substantially orthogonal to the same, said first portion 24 and said second portion 26 are made integral or constrained between them.

[0035] Said first portion 24 being positionable in proximity of a working zone, instead said second portion 26 being distal respect to said working zone and in particular substantially parallel to the feet of an user in a way to not interfere with the same.

[0036] Preferably said at least a knees supporting portion 30 being constrained and/or made integral to said first portion 24 of said frame 20 and in particular in proximity of the extremities of the same.

[0037] Advantageously in this way it is possible to make much more comfortable said working activity in said knelt down position remaining in proximity of a working zone, as if said supporting device 10 were not present, and at the same time without having elements or things positioned between said user and said working zone which would disturb and/or would obstacle said working activity.

[0038] Preferably said at least a knees supporting portion 30 are at least two knee pads 30 constrained or made integral to said frame 20 in particular respectively near of two extremities of said first portion 24.

[0039] Preferably said at least two knee pads 30 are fixed to said substantially planar frame 20 through releasable fixing means which are in particular insertable in couple of bores realized in said frame 20 in such a way to constrain and maintain in position each knee pad 30, permitting at the same time an easy replacement of the same.

[0040] Advantageously this permit to use said supporting device 10 without have to assume an uncomfortable intermediate positions, cause it permit to approach to the same walking normally, in fact said portions 26 being narrow permit to an user an easy approach to said at least a knees supporting portion 30 without that the same could with said supporting device 10.

[0041] In other terms in this way it is possible to avoid that said user should have to open his legs or have to modify his way to walk in order to approach to said at least a knees supporting portion 30.

[0042] Advantageously in this way an user can easily position the feet in front of said at least a knees supporting portion 30 and after that simply to kneel down on the same, maintaining said second portion 26 between the legs without that the same could interfere with the legs or the feet of the user.

[0043] Advantageously this permit to maintain substantially vertical a back of an user, in a way to not tire the same user during said working activity.

[0044] Besides this shape permit to an user to maintain the feet lean to said floor 95 in a way to determine a lever for exercise a greater force during said working activity, maintaining at the same time an high comfort.

[0045] Advantageously this permit to pass easily and quickly from a knelt down position, in which an user results with the knees lean to said at least a supporting portion 30, to a position in which an user result standing up or knelt down but with the feet that support all his weight, for exercise a greater force during said working activity.

[0046] Preferably besides said support device 10 of an user in a working activity comprises at least a box 60 in particular of tools which results advantageously in particular positioned between two knees supporting portions 30 in such a way for permitting to place easily a series of objects in said box during said working activity.

[0047] According to a preferred form of embodiment

said substantially planar frame 20, preferably substantially "T" shaped, it is realized in just one piece in a polymeric material as for example polymer reinforced preferably with glass fibres, and in particular said frame 20 is integrated with at least a box 60 of tools and in particular also with at least an housing portion 22 of said at least a pivotable wheel 54.

[0048] Advantageously in this way it is obtained a supporting device 10 with a reduced number of components, with low assembling costs and at the same time light and easy to transport.

[0049] In particular said frame 20 result substantially "T" shaped and it is realized preferably in just one piece.

[0050] According to a preferred form of embodiment said frame 20 is a metallic frame 20 realized with a metallic plate preferably substantially shaped as "T" or as "Y" which is provided in particular of stiffening ribs, and besides which is preferably integrated with at least an housing portion 22 of said at least a pivotable wheel 54 and in particular also with a box 60 of tools.

[0051] Besides preferably said metallic frame 20 comprises a tubular metallic portion 26 substantially "U" shaped which is fixed or made integral to said metallic plate substantially shaped as "T" or "Y", in particular "T" shaped, said tubular metallic portion substantially "U" shaped being aligned with a central portion of said metallic plate in such a way to result only partially overlapped with the same, in a way to have an high stiffen of said frame 20.

[0052] Preferably, in proximity of said at least an housing portion 22 of said at least a pivotable wheels 54, said tubular metallic portion 26 substantially "U" shaped defines a catching portion 27 for facilitate the transport of said supporting device 10.

[0053] Preferably said frame 20 is a tubular metallic frame 20 realized in particular through a tubular metallic profile which follow preferably an external profile substantially of "T".

[0054] In particular said frame 20 is realized by two tubular metallic elements, preferably substantially symmetric respect to a longitudinal direction 98, which are made integral in just one piece or which are constrained to the correspondent extremities in particular through two correspondent screws 29, said two tubular metallic elements follow respectively an external profile of an half "T".

[0055] Advantageously in this way it is obtained a supporting device 10 much simple and besides easy to realize and easy to assemble.

[0056] Advantageously in this way it possible to reduce the weight on the knees, permitting to an user to maintain at the same time a position with his back substantially vertical, in a way to not tire the same and at the same time in a way to give the possibility to exercise the necessary force for perform said working activity.

[0057] Said frame 20 comprises preferably a support portion 40, usable as a seat, provided of connection means (45,47) which connect said support portion 40 to said frame 20 and in particular to a second portion 26 of said frame 20, further said connection means (45,47) permit an adjustment of the height and preferably also an adjustment of the inclination of said support portion 40.

[0058] Preferably said connection means (45,47) comprises elastic means and/or a shock absorber preferably of gas type which constrain said supporting portion 40 to said frame 20 in particular in a rotatable way.

[0059] Preferably said connection means (45,47) permit an adjustable fixing also along a longitudinal direction 98 in a way to be perfectly adjusted for each user.

[0060] Advantageously through said shock absorber it is possible to support at least partially the weight of an user besides facilitating enormously the maintaining of a knelt down position for much more time without to tire the user.

[0061] Advantageously this permit to have a supporting device 10 much stable, ergonomic and balanced which at the same time permit to an user to substantially eliminate the weight and the fatigue consequent to said knelt down position, permitting to said user to maintain his back in the same substantially vertical position.

[0062] In other terms said supporting device 10 permits to maintain the same position that an user would assume without the supporting device 10, eliminating at the same time the weight and the fatigue determinate by said knelt down position.

[0063] In fact in this way it permit to eliminate the weight and the fatigue as of the knees as of the back because it permit at least in part to support the weight of the user by means of said support portion 40.

[0064] Besides in case of need an user can modify said knelt down position easily and simply or get up with just one movement.

[0065] Besides advantageously said supporting device 10 results extremely compact, light and easy to transport.

[0066] In this way it has been seen that a supporting device according to the present invention achieves the objectives previously mentioned.

[0067] The supporting device of the present invention thus conceived can undergo to numerous modifications and variations, all included in the same inventive concept.

[0068] Furthermore, in practice the materials used, as well as their dimensions and the components, can vary according to the technical needs.

Claims

1. Supporting device (10) for facilitate a working activity in a knelt down position, said supporting device (10) comprising a substantially planar frame (20) and a plurality of wheels (50) hinged to said frame (20), **characterized by** comprising at least a knees supporting portion (30) constrained or made integral to said frame (20) and **characterized in that** said plurality of wheels (50) comprises at least a pivotable wheel (54) and **in that** each wheel of said plurality

of wheels (50) shows a rotation axis (52) which lie substantially in a barycentric plane (90) of said frame (20).

2. Supporting device (10) according to claim 1, **characterized in that** said plurality of wheels (50) comprises a plurality of wheels with fixed rotation axis (50), preferably two, which are laterally hinged to an external perimeter of said frame (20).

3. Supporting device (10) according to claim 1 or 2, **characterized by** comprising at least an housing portion (22) of said at least a pivotable wheel (54) which is constrained and/or made integral to said frame (20), said at least an housing portion (22) extends upperly to said substantially planar frame (20) in such a way to make result substantially in said barycentric plane (90) a principal rotation axis (56) of said at least a pivotable wheel (54).

4. Supporting device (10) according to any one of the claims from 1 to 3, **characterized in that** said plurality of wheels (50) comprises three wheels (50) of which at least one is a pivotable wheel (54).

5. Supporting device (10) according to any one of the claims from 1 to 4, **characterized in that** said frame (20) result substantially shaped as "T" or as "Y" in such a way to permit an easy approach with the feet to said at least a knees supporting portion (30).

6. Supporting device (10) according to any one of the claims from 1 to 4, **characterized in that** said frame (20) result substantially "T" shaped and it is realized preferably in just one piece.

7. Supporting device (10) according to any one of the claims from 1 to 6, **characterized in that** said frame (20) comprises a first portion (24) and a second portion (26) which extends starting from a substantially central lateral zone of said first portion (24) in a direction substantially orthogonal to the same, said first portion (24) and said second portion (26) are made integral between them.

8. Supporting device (10) according to claim 7, **characterized in that** said at least knees supporting portion (30) being constrained and/or made integral to said first portion (24) of said frame (20).

9. Supporting device (10) according to claim 8, **characterized in that** said at least a knees supporting portion (30) are at least two knee pads (30) constrained or made integral to said frame (20) in particular respectively near of two extremities of said first portion (24), preferably said at least two knee pads (30) are fixed to said substantially planar frame (20) through releasable fixing means which are in particular insertable in couple of bores realized in said frame (20) in such a way to constrain and maintain in position each knee pad (30).

10. Supporting device (10) according to any one of the claims from 1 to 9, **characterized by** comprising at least a box (60) in particular of tools which results in particular positioned between two knees supporting portion (30).

11. Supporting device (10) according to any one of the claims from 1 to 10, **characterized in that** said frame (20) substantially planar is realized in just one piece in a polymeric material as a glass fibres reinforced polymer, in particular said frame (20) being integrated with at least a box (60) of tools and in particular also with at least an housing portion (22) of said at least a pivotable wheel (54).

12. Supporting device (10) according to any one of the claims from 1 to 10, **characterized in that** said frame (20) is a metallic frame (20) realized with a metallic plate preferably substantially shaped as "T" or as "Y" which is provided in particular of stiffening ribs, and besides which is preferably integrated in just one piece with at least an housing portion (22) of said at least a pivotable wheel (54) and in particular also with a box (60) of tools.

13. Supporting device (10) according to any one of the claims from 1 to 10, **characterized in that** said frame (20) is a tubular metallic frame (20) realized in particular through a tubular metallic profile which follow preferably an external profile substantially of a "T".

14. Supporting device (10) according to claim 13, **characterized in that** said frame (20) is realized by two tubular metallic elements, preferably substantially symmetric respect to a longitudinal direction (98), which are made integral in just one piece or which are constrained to the correspondent extremities in particular through two correspondent screws (29), said two tubular metallic elements follow respectively an external profile of an half "T".

15. Supporting device (10) according to any one of the claims from 1 to 14, **characterized by** comprising a support portion (40) provided of connection means (45,47) which connect said support portion (40) to said frame (20) and in particular to a second portion (26) of said frame (20), further said connection means (45,47) permit an adjustment of the height and preferably also an adjustment of the inclination of said support portion (40).

16. Supporting device (10) according to claim 15, **characterized in that** said connection means (45,47) comprise elastic means and/or an adjustable shock

absorber preferably an adjustable gas shock absorber which constrains said support portion (40) to said frame (20) in particular in a rotatable way.

17. Supporting device (10) according to claim 15 or 16, **characterized in that** said connection means (45,47) permit an adjustable fixing also along a longitudinal direction (98) in such a way to be perfectly adjustable on the basis of each users.

FIG. 1

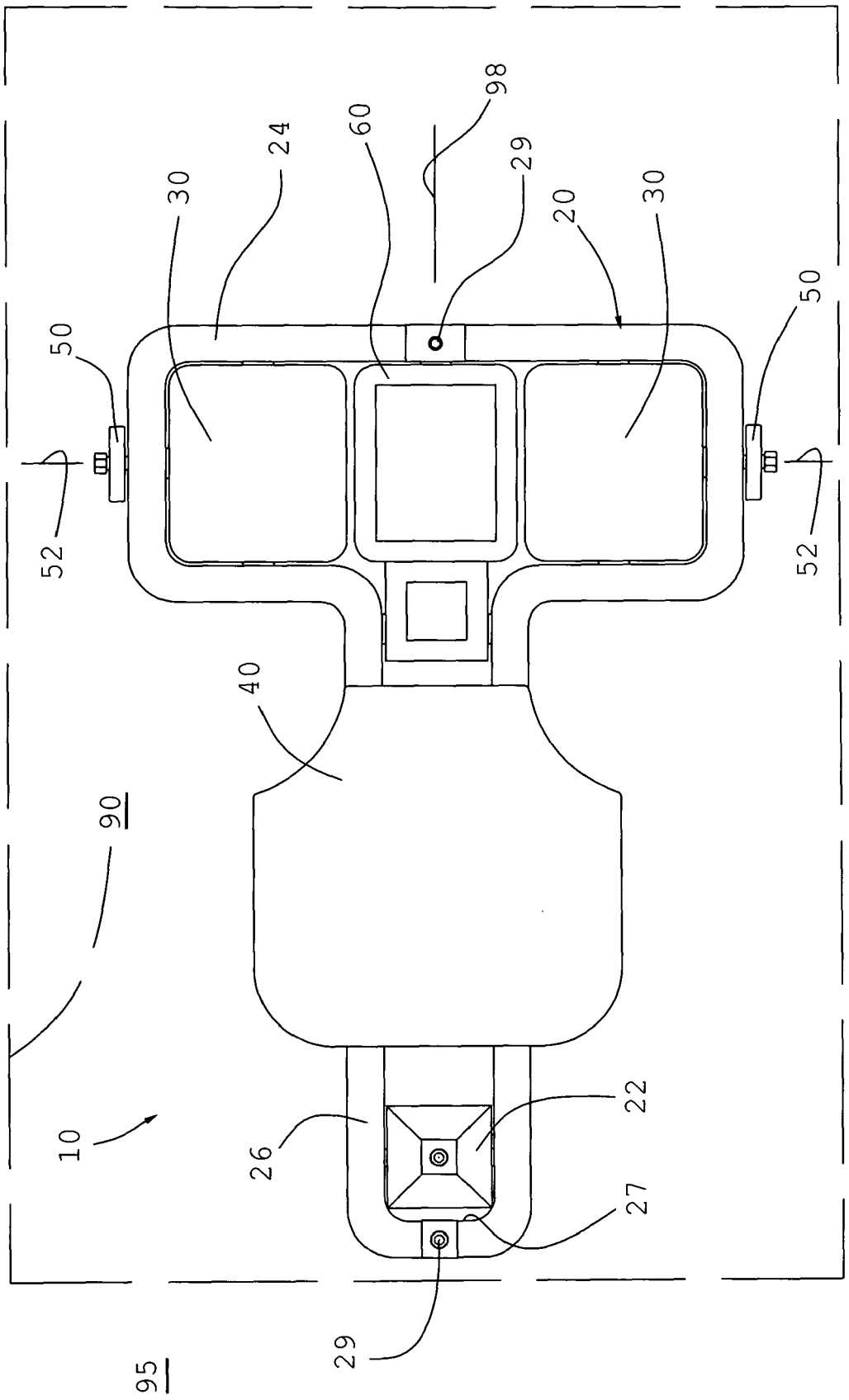


FIG. 2

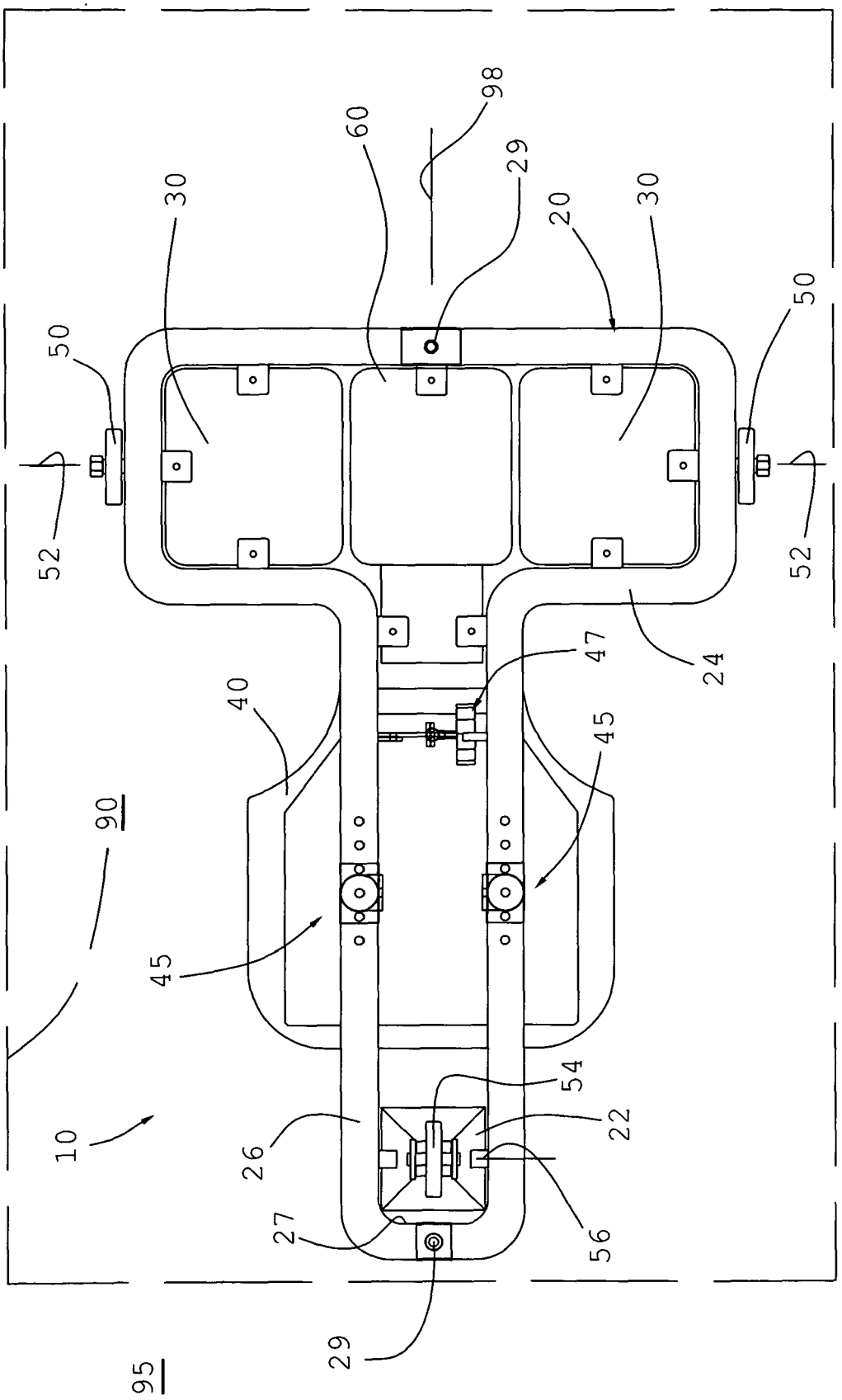


FIG. 3

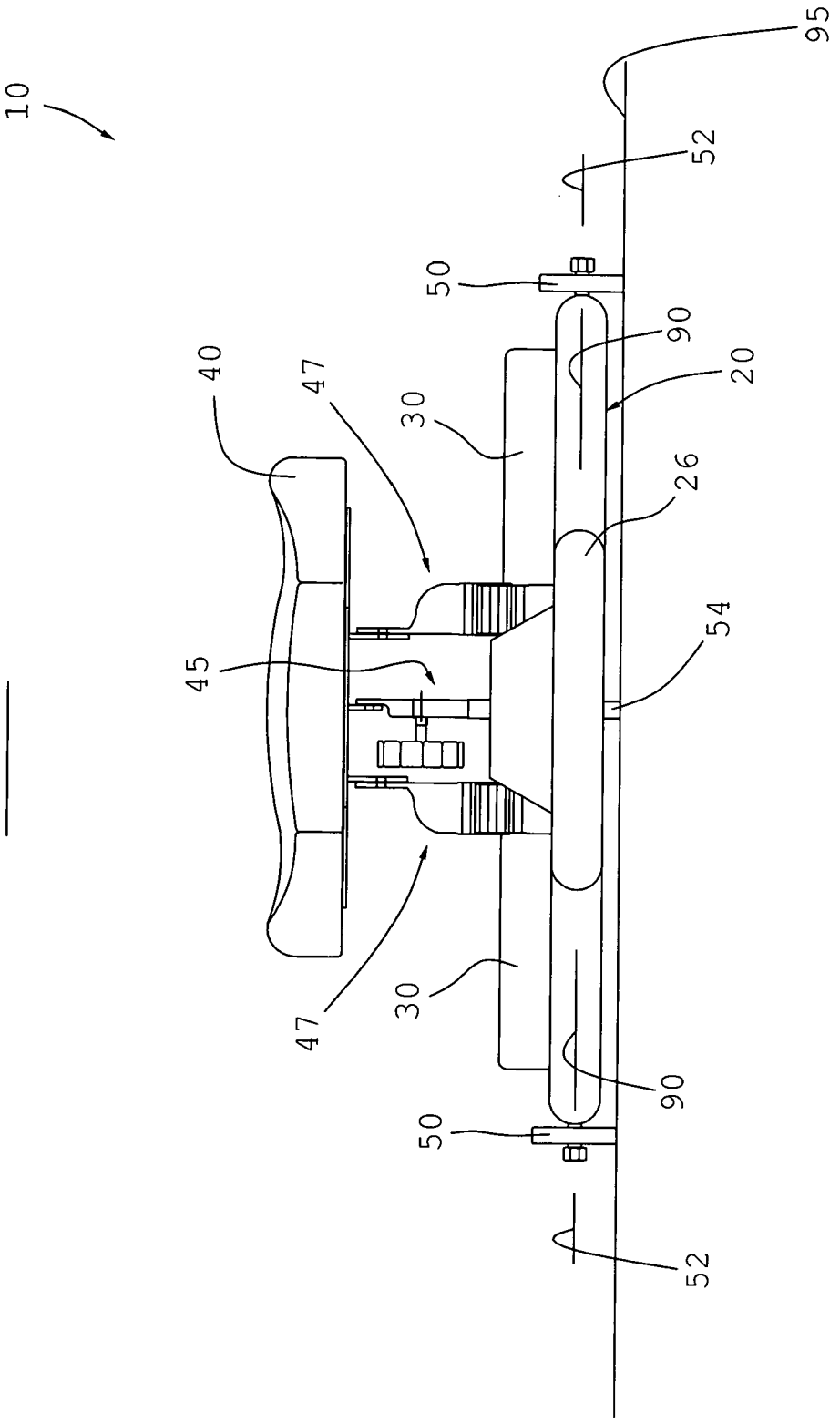


FIG. 4

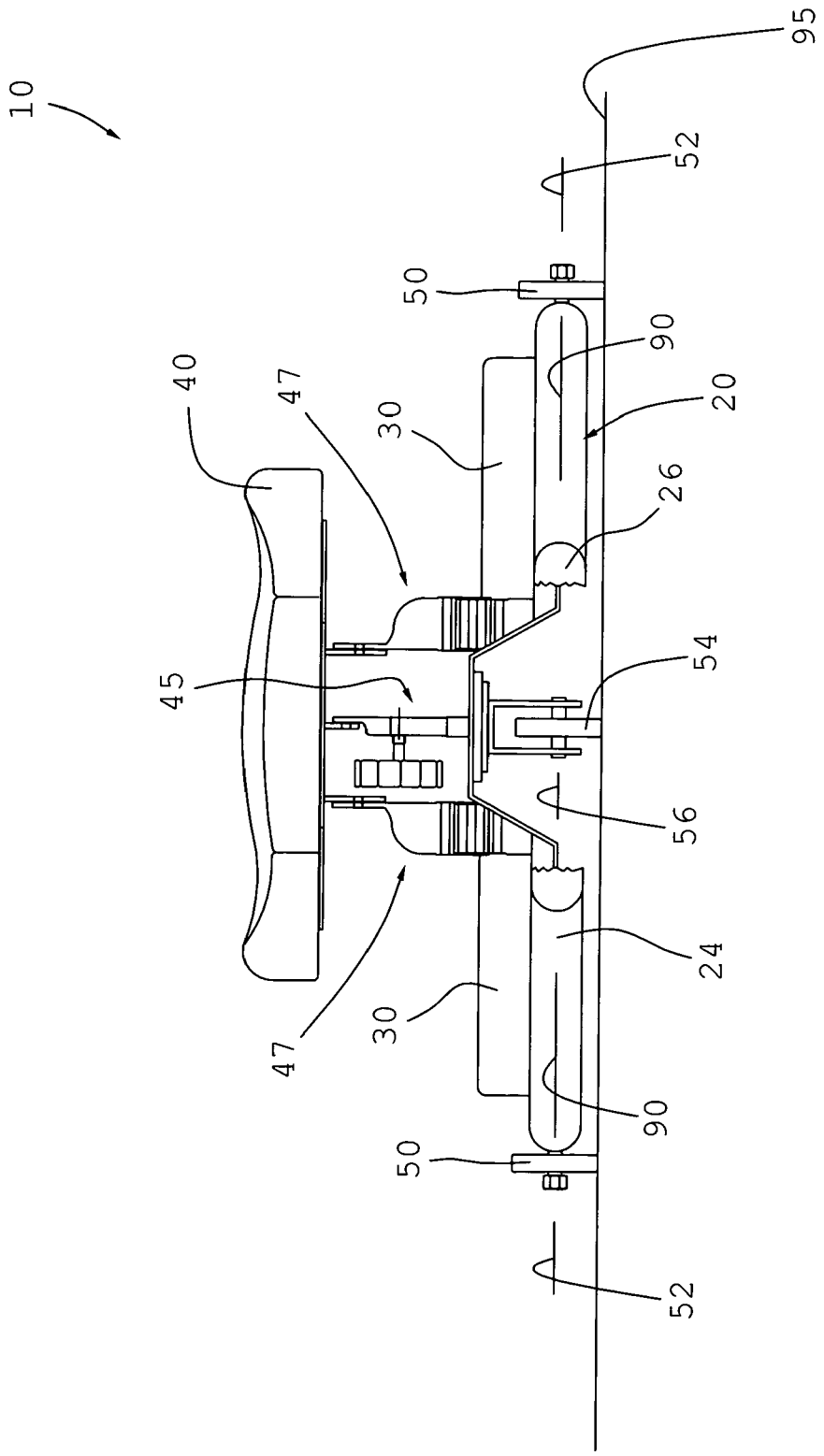
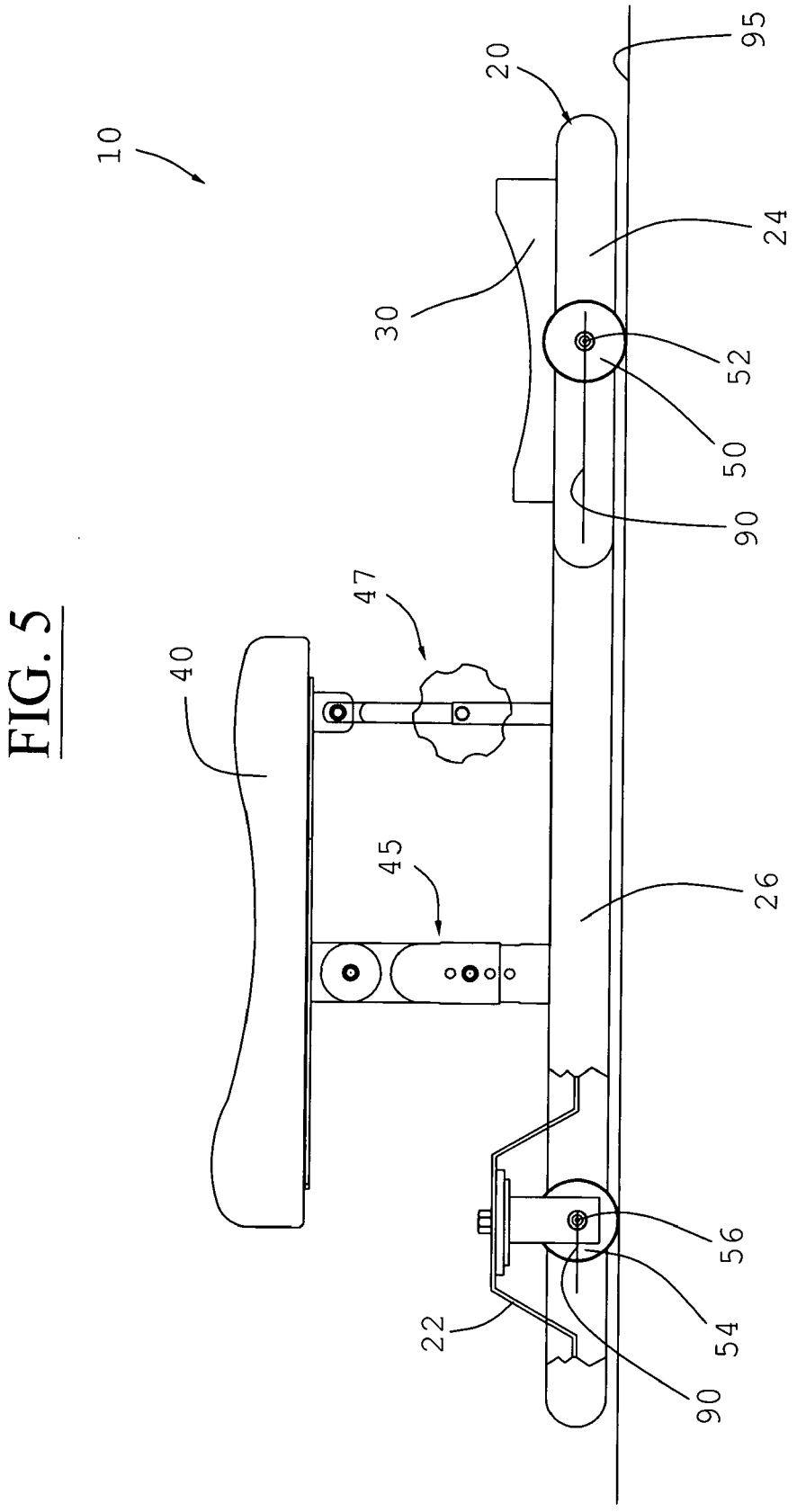


FIG. 5



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EUROPEAN SEARCH REPORT

Application Number
EP 10 00 6485

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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
Munich	4 October 2010	Endrizzi, Silvio

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 10 00 6485

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