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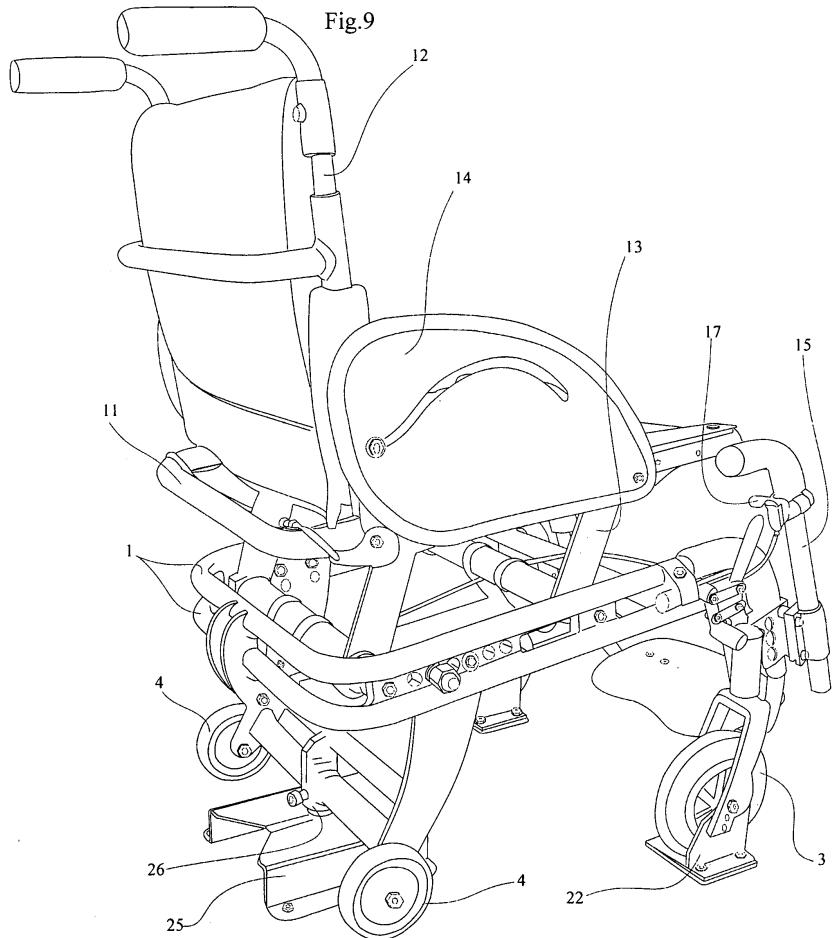
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(54) Manual wheelchair for disabled persons with seat adjustable in height

(57) It is a manual wheelchair for disabled in which the seating (11) and connected backrest (12) and accessories (14) own a separate framework connected in an articulated way (13, 13') to the below loading framework (1) and suitably distanced, equipped with an actu-

ator (16) which by control (17) of the seating occupant changes the level in the position choosen by him. The seating (11) can be for example adjusted to the level of the sanitations devices usually installed in the buildings or to the level of the usual chairs.



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Description

[0001] The purpose of this invention is a wheelchair for disabled persons, of manual type, improved to change the height of the seat level, to adjust it according to the requirements of the disabled person who is using it.

[0002] The wheelchair for disabled persons, opportunely improved, allows the disabled person to lower down, if necessary, the seating level to the height of installed sanitation (toilet, bidet, washbasin etc.), to lower it to the required height when approaching desks of working tables, so allowing the user to hold his back straight, to lower it at the level of the normal chairs or seats in the transport means, and at the end, with the same lowering easiness, to restore the height of the seat when the wheelchair is used as wheelchair to be moved.

State of the technique

[0003] It is well known that in the field of the aids for disabled persons, in particular for the wheelchairs, the effort of the manufacturers is meant to improve the quality of life of the disabled persons who use these wheelchairs.

[0004] There are types of well-known wheelchairs: motor-driven wheelchairs, wheelchairs which can be equipped to climb steps for going up and down are known, wheelchairs with raisable seating to allow the disabled persons to reach for ex. to the different levels of shelves etc.

[0005] A problem not yet solved and which is one of the inconveniences of the well-known technique concerns the common manual marketed wheelchairs which do not give the possibility of using for ex. the sanitary fixtures normally installed in the home range or in the private or public working environments.

[0006] In fact, the level of the seat which is applied for the fixed manual wheelchairs is fixed and appears to be higher than the levels as previously mentioned of certain sanitation equipments.

[0007] In fact, to compensate for this, it is normally used equipments to be placed on the top of the sanitary fixtures in order to have it at the same level of the wheelchair seating; or in case of desks or working tables because the disabled person who is seated on a normal manual chair presently available could be able to use them like non disabled persons, who use the normal chairs (which seating is at a level lower than the seating of the manual wheelchair existing on the market), it is necessary to use systems to raise suitably the above desks or working tables.

Presentation of the invention.

[0008] The purpose of the invention is to eliminate the limits on the performances possible with the normal wheelchairs for disableds presently existing in the market

which are part of the known technique.

[0009] The manual wheelchair improved by the patent, with an execution extremely simplified allows to lower the seating flat from the height adopted following the known technique for normal manual wheelchairs to the requested level for certain uses which contribute to improve the quality of the life of the disabled.

[0010] The execution is obtained structuring the wheelchair with the bearing framework which allows to support a separate framework connected to the seating (and connected to the backrest) which by hand control by the disabled who is over is lowered from the level adopted in the wheelchair when it is used as wheelchair; level which corresponds to that one owned by the normal wheelchairs marketed in line with the known technique.

[0011] The framework of the seating (and connected backrest) is connected to the below bearing framework in a way to stay somewhat apart from the said below bearing framework with connection mechanical elements of known type (with system of cross rods, with small connecting rods, ecc.).

[0012] The raise of the seating with the overlooking weight of who is seated is obtained by an actuator (which preferably uses the pressure of a gas in cooperation with a spring).

[0013] To lower or raise the seating the person who is over acts on a small lever which, by a wire inside a sheath, activate or disconnect the actuator.

[0014] For the descent of the seating due to the simpleness of the raising device it is necessary to have the weight of the person seating over the seating.

[0015] It must be precised that the wheelchair on examination lends to be used by a disabled who is efficient on his upper limbs, for the reasons below explained.

[0016] Indeed due to the simpleness of the raising apparatus which must be lightweight in order to don't weight down the wheelchair, the disabled can contribute to raise or lower himself grasping the two handles placed on the front, one on the right and the other one on the left fixed to a bearing framework.

[0017] These handles, depending on the anatomical configuration of the disabled who uses the wheelchair, are suitably fixed to the necessary height.

[0018] One of the objectives of this patent which achieves the wheelchair with the seating which can be lowered is that one of the simplification of the structure and of the various parts connected to the purpose to don't weight down excessively to don't create discomfort compared with the usual manual wheelchairs with fixed seating existing in the market.

[0019] The excessive weight would represent an important discomfort when the wheelchair must be manouvered and in particular raised to be for example placed inside vehicles.

[0020] Another objective of this patent is its practicalness of use which doesn't differ substantially from the normal manual wheelchairs with the fixed seating. In-

deed to change the level of the seating the occupant must simply act on a lever applied in a comfortable position near one of the handles for anchorage of the disabled when he contributes to lower or raise the seating.

[0021] Another purpose of this patent which achieves the wheelchair with the seating which can be lowered is that one to conform the seating level to level of the seatings of the transport vehicles (cars, bus, ecc.) when the wheelchair is placed inside the vehicles allowing the disabled who occupy the seating to be in conditions to look out of the windows remaining straight, like the other passengers, without needing to recline the head.

[0022] Favourably the wheelchair object of the invention, having the possibility to adjust the level of the seating, it can be mounted on the driving place of the vehicle, suitably adapted and homologated for disabled, replacing the normal seat with which it is usually equipped the vehicle, obviously having arranged on the floor the suitable locking and anchorage points.

Short description of the drawings.

[0023] The features of the founded following the objectives previously considered and others which will arise from the description of the drawings will result underlined in the claims following listed.

[0024] The description of the enclosed drawings concerns an exemplified form chosen on preferential sense and therefore not limitative.

[0025] The fig. 1 shows the manual wheelchair following the founded which seating is placed on the level which is adopted in the normal manual wheelchairs used which represent the status of the known technique.

[0026] For clarity of the drawing the pushing wheels are indicated with the circumference which limit the encumbrance.

[0027] The fig. 2 shows the manual wheelchair considered in the fig. 1 where know the seating results lowered in support to the below bearing framework which support it. They are not indicated the pushing wheels and the wheelchair on the back lays on the floor on two suitable castors with which it is equipped.

[0028] The front pivoting wheels result placed within the locking brackets which have front splits which allow the insertion of their axles.

[0029] The fig. 3 shows schematically the section of the bearing structure of the wheelchair following a vertical transversal median flat.

[0030] The fig. 4 shows schematically out of coupling the section of the frame of the seating following a vertical transversal median flat.

[0031] The fig. 5 shows schematically the section of the bearing structure of the wheelchair following a vertical longitudinal median flat.

[0032] The fig. 6 shows schematically out of coupling the section of the frame of the seating following a vertical longitudinal median flat.

[0033] The fig. 7 shows out of action the actuator for

the movements of the seating until lowering also close to the bearing structure and to its reset at the level owned by the wheelchair when it is used for its moving.

[0034] The fig. 8 shows axonometrically a side and a top view of the wheelchair of the patent with seating raised compared to the below bearing structure equipped with pushing wheels on its normal arrangement to be moved.

[0035] The fig. 9 shows axonometrically a side and rear view of the wheelchair of the patent with the seating raised, without the pushing wheels and with laying to the floor by auxiliary rear castors.

[0036] The front pivoting wheels are placed on the blocking stirrups fixed to the floor with frontal splits to insert the axles of the said front wheels and the pin with vertical location towards the floor, integral with the rear lower part of the bearing structure, (the active part of the pin is not visible on the figure) inserted in the locking apparatus fixed to the floor.

[0037] The fig. 10 shows axonometrically a side and top view of the wheelchair of the patent frontally locked to the floor with the front wheels and on the back with the vertical pin integral to the rear structure, as described in fig. 9.

[0038] For clarity of the design it is shown only the push wheel applied on the inner side.

[0039] Like it arises from the figures of the drawings.

[0040] The wheelchair includes a bearing framework 11 equipped with two pushing wheels 2 and two pivoting front wheels 3 supported by the joints 7 connected to the bearing framework 1.

[0041] In addition it is equipped with rear castors placed to the end of the legs 6 when for space saving are removed the pushing wheels 2.

[0042] The seating is equipped with a distinct framework 11 (supporting the backrest 12 and the armrests 14) which can be spaced out from the below bearing framework 1 from the upper arms 13 and 13' of levers making fulcrum in 19 and 19' in the bearing framework 1.

[0043] The arms 13 and 13' result connected by their ends to the seating framework 11 by the hinging 20 and 20'.

[0044] The ends of the lower arms 23 and 23' opposed to the arms 13 and 13' of the levers making fulcrum on the bearing framework 1, are connected to the actuators 16 by the hinging 20 and 20'.

[0045] When the occupant of the seating wants to lower it he acts on the lever 17 fixed to the post 15 which, by the wire with sheath 18, acts on the actuator 16.

[0046] The lowering happens in a progressive and controlled way stopping where the occupant consider useful and this can be in continuity until leaning against the below framework 1.

[0047] Acting the lever 17 in sense opposite to the actuator 16 acting on the arms 23 and 23' and therefore on the opposed arms 13 and 13' it is raised the seating progressively and on a controlled way, stopping at the level considered the most useful by the user, until reset-

ting the maximum height.

[0048] It must be specified that both on the descent of the seating 11 and on the uprise, as previously said, it can be placed at the intermediate desired level.

[0049] When the manual wheelchair must be fixed to the floor (which can be that one of a vehicle, when the disabled is like a passenger, or as driver on the driving place) following known systems, the pivoting front wheels are stopped and kept in reciprocity to their axles on the suitable stirrups 22, and the rear pin 24 with vertical placement towards the floor, integral to the crossbar 10 fixed in the rear part of the bearing structure 1, is inserted and kept by the apparatus 25.

[0050] After what previously explained it results the validity of the innovation which contribute to increase the quality of the life of the disabled improving the common manual wheelchairs with simple and cheap interventions rendering the use of level adjustment of the seat on a way simple and convenient.

[0051] It doesn't move from the patent for any execution also of improvement which could be made by a person expert on the field who uses the teachings of this invention.

Claims

1. Manual wheelchair for disabled with seating adjustable in height **characterized by** the fact that the seating (11) on control of the person who occupies it is capable of descend to lower levels compared to the level adopted for its movements of wheelchair and equally the seating (11) previously lowered on control of the person who occupies it is capable to raise until reset of the initial level.
2. Wheelchair for disabled with seating adjustable in height following claim 1 **characterized by** the fact that the seating (11) on control of the person who occupies it can be placed time by time to the levels choosen by the above said person who occupies it.
3. Manual wheelchair for disabled with seating adjustable in height following the claim 1 **characterized by** the fact that on the sides of the front part are fixed to the bearing structure (1) two risers (15) ending at the top with two handles easy accessibles and which can grasped by the occupant of the seating (11) for the purpose to allow the above said occupant to contribute by the force of his arms, in case it would be necessary, for the lowering or raising of the seating (11) being the actuator (16) fitted of lower power in order to don't weight down the wheelchair.
4. Manual wheelchair for disabled with seating adjustable in height following the claim 1 **characterized by** the fact that the seating (11) has its own frame-

work usually supported spaced out from the below bearing structure (1) by metal elements (13, 13') which allow its placing at intermediate levels from its maximum distance from the below bearing framework (1) until the laying.

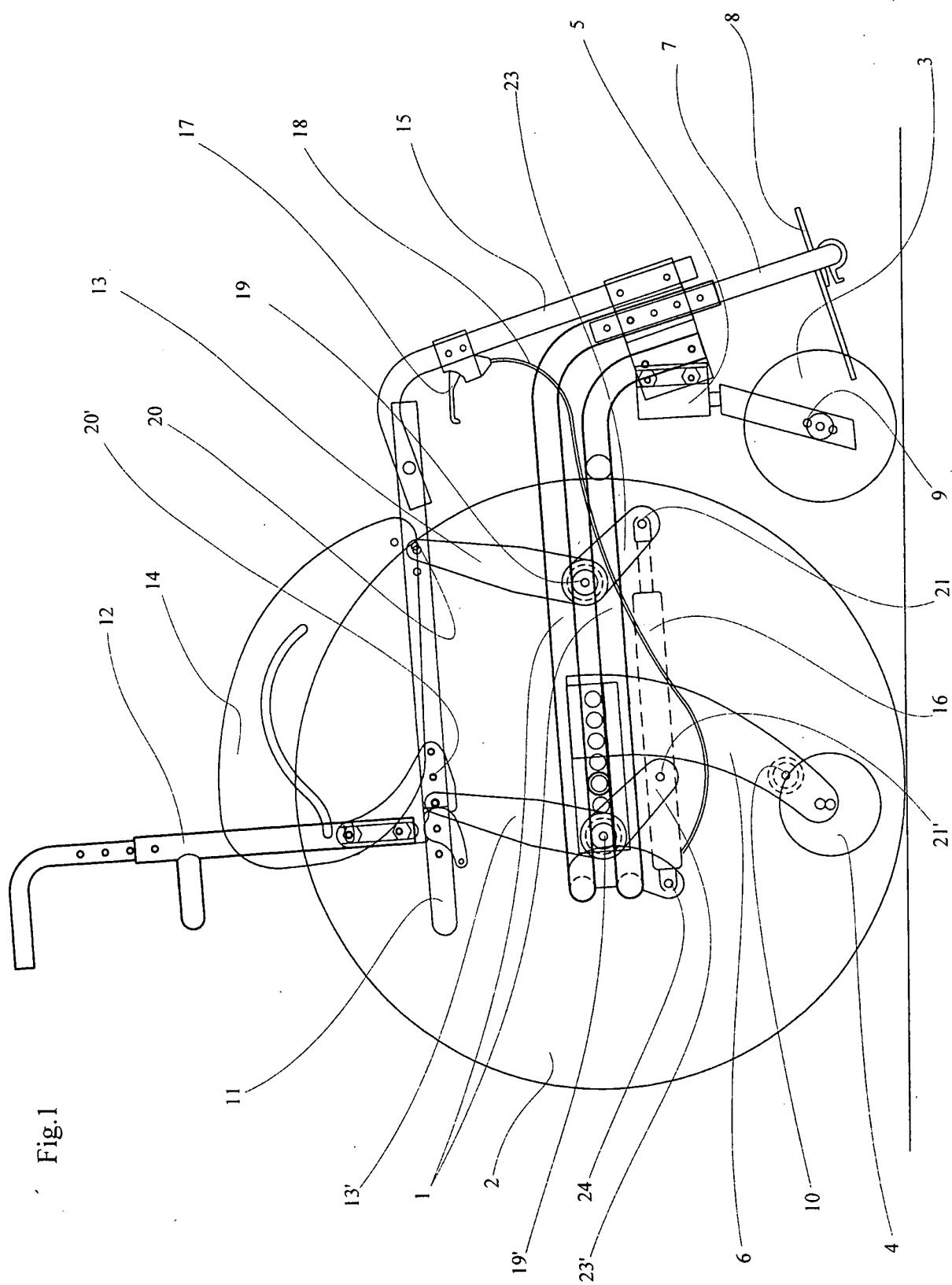
5. Manual wheelchair for disabled with seating adjustable in height following the claim 1 **characterized by** the fact that the control for the lowering of the seating (11) and after for its raising is made by a lever (17) applied near one of the handles placed on the top of the posts (15) available for the occupant of the seating (11) easy to be manouvered, like the brake lever applied to the bicycle handlebar.
10. Manual wheelchair for disabled with seating adjustable in height following claim 1 **characterized by** the fact that the mechanical elements which connect the framework of the seating (11) to the below bearing framework (1) are composed by two arms levers (13, 13', 23, 23') making fulcrum (19, 19') on the below bearing structure (1) where the ends of the upper arms (13, 13') are hinged (20, 20') on the frame of the seating (11) and which ends of the lower arms (23, 23') are hinged (21, 21') on the structure moved by a suitable actuator (16), connected to the framework (1) in the point (26).
15. Manual wheelchair for disabled with seating adjustable in height following claim 1 **characterized by** the fact that the actuator (16) which moves the ends (21, 21') of the lower arms (23, 23') of the levers (13, 13') which connect the framework (20, 20') of the seating (11) with the below (19, 19') bearing structure (1) of the manual wheelchair is of simplified type gas charged.

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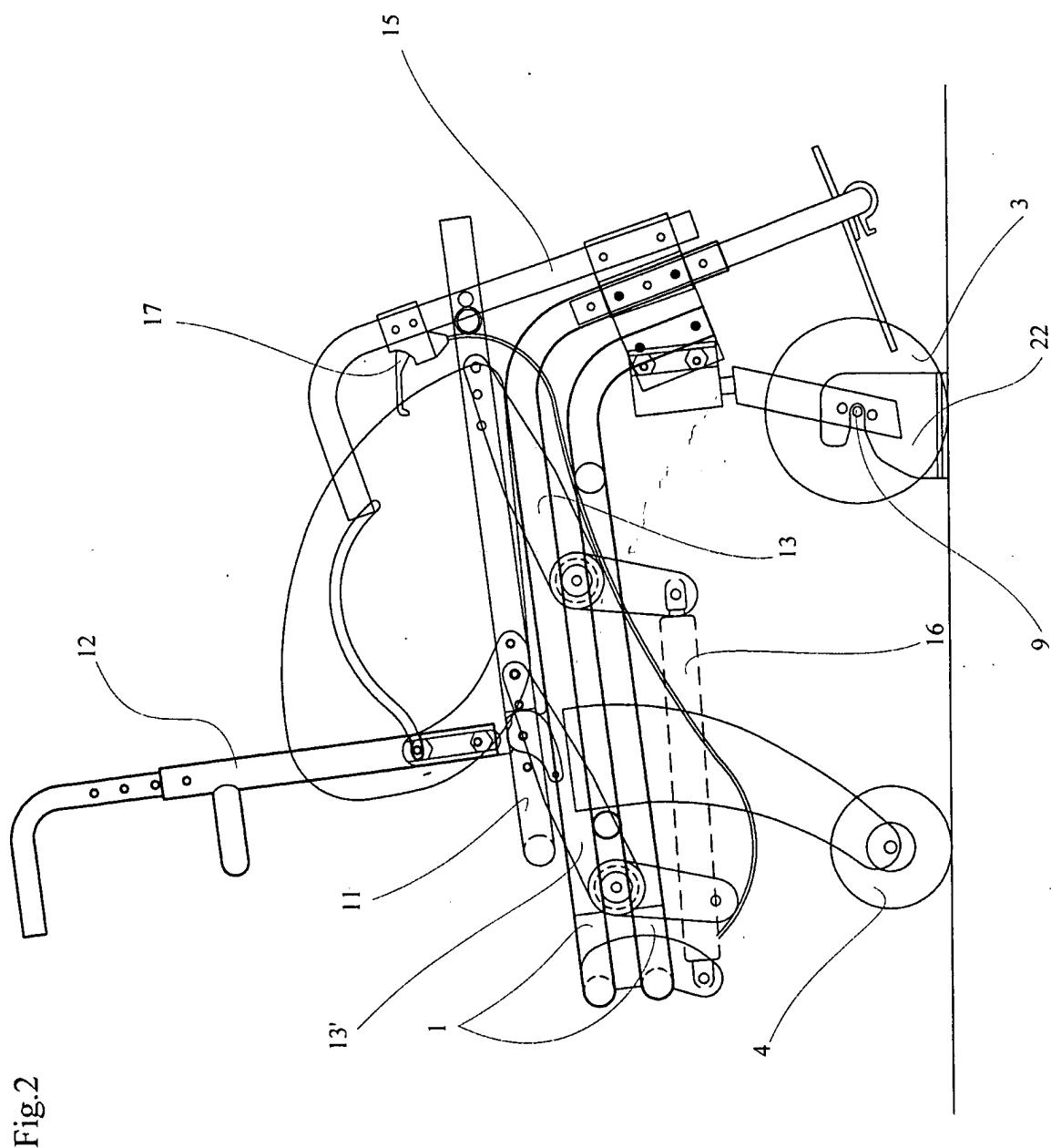


Fig.2

Fig.6

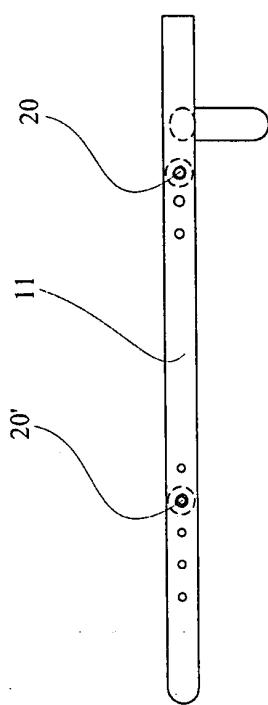


Fig.5

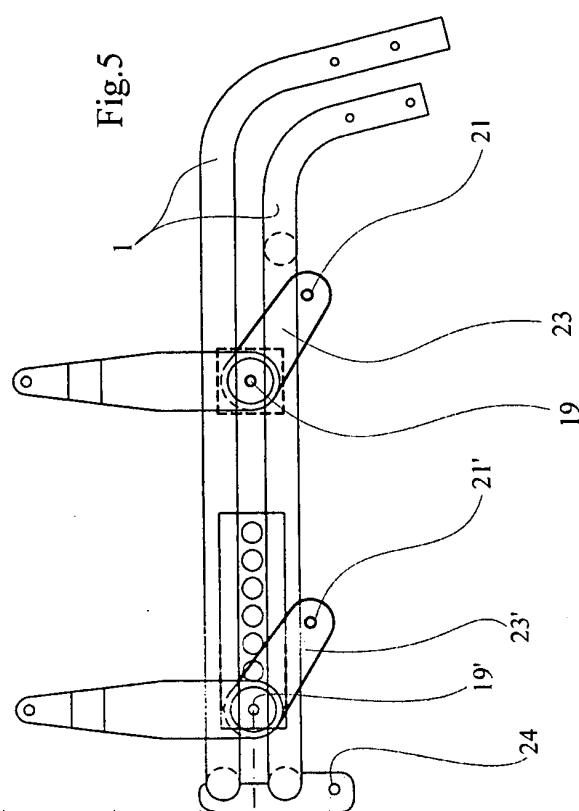


Fig.3

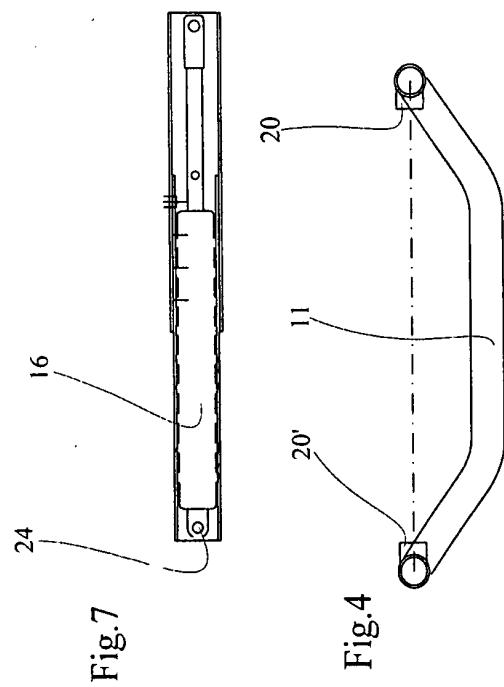
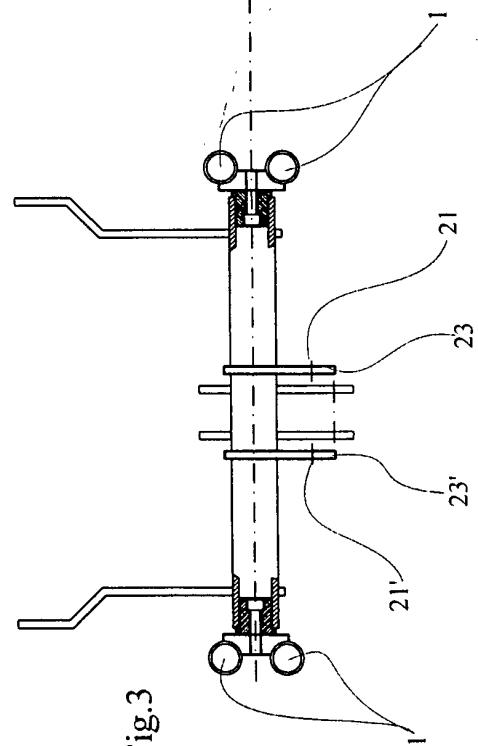
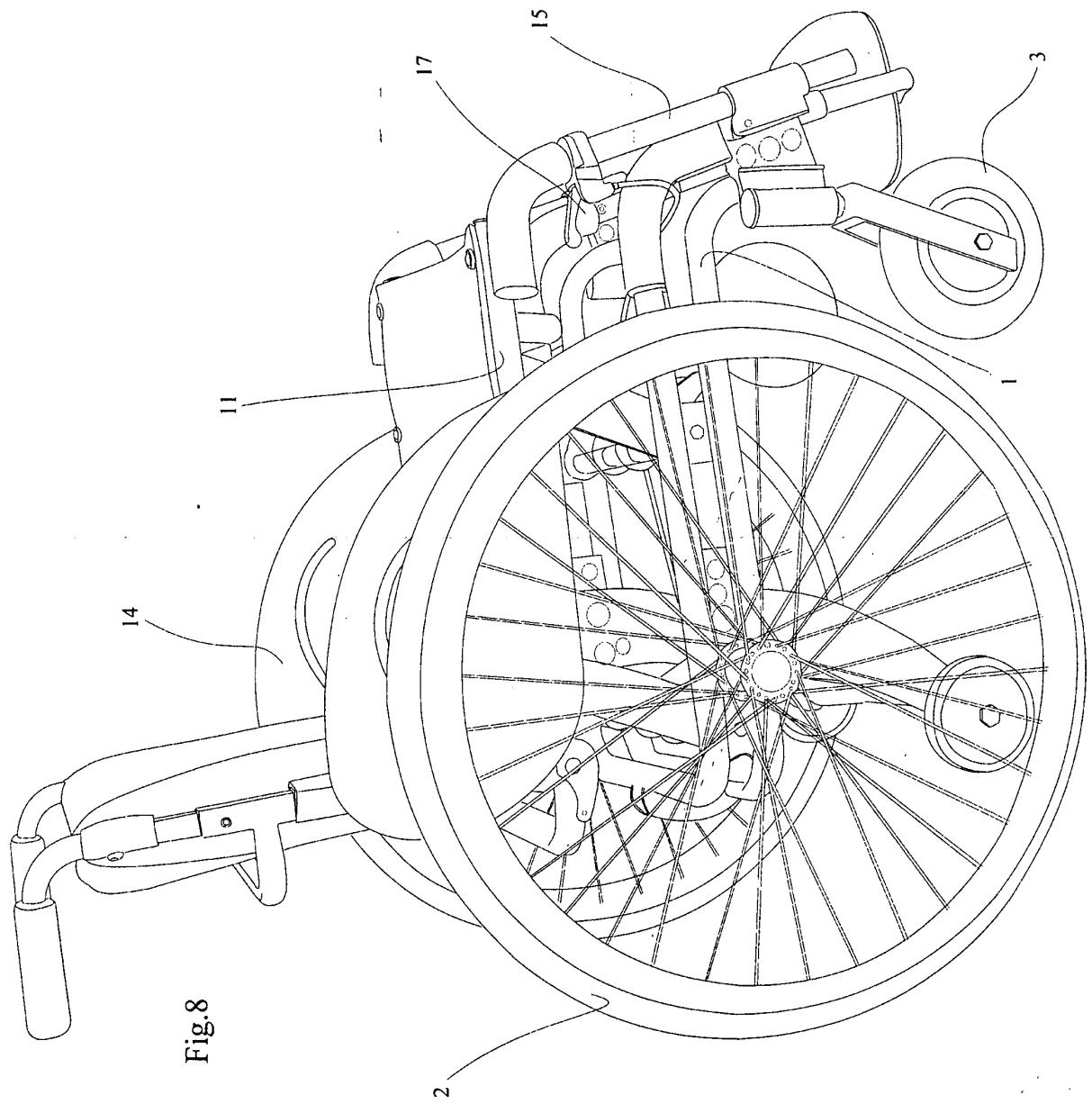


Fig.7



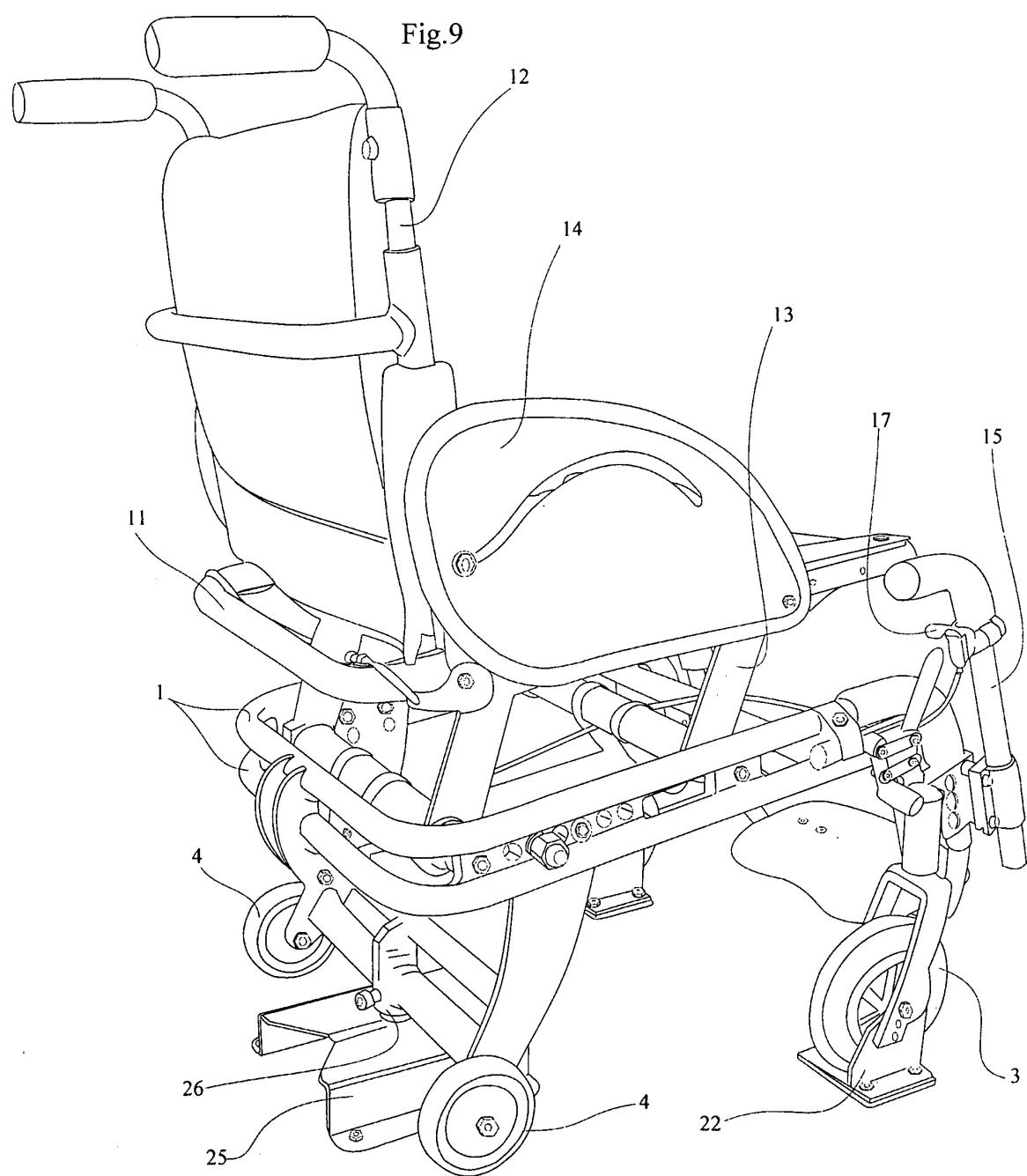
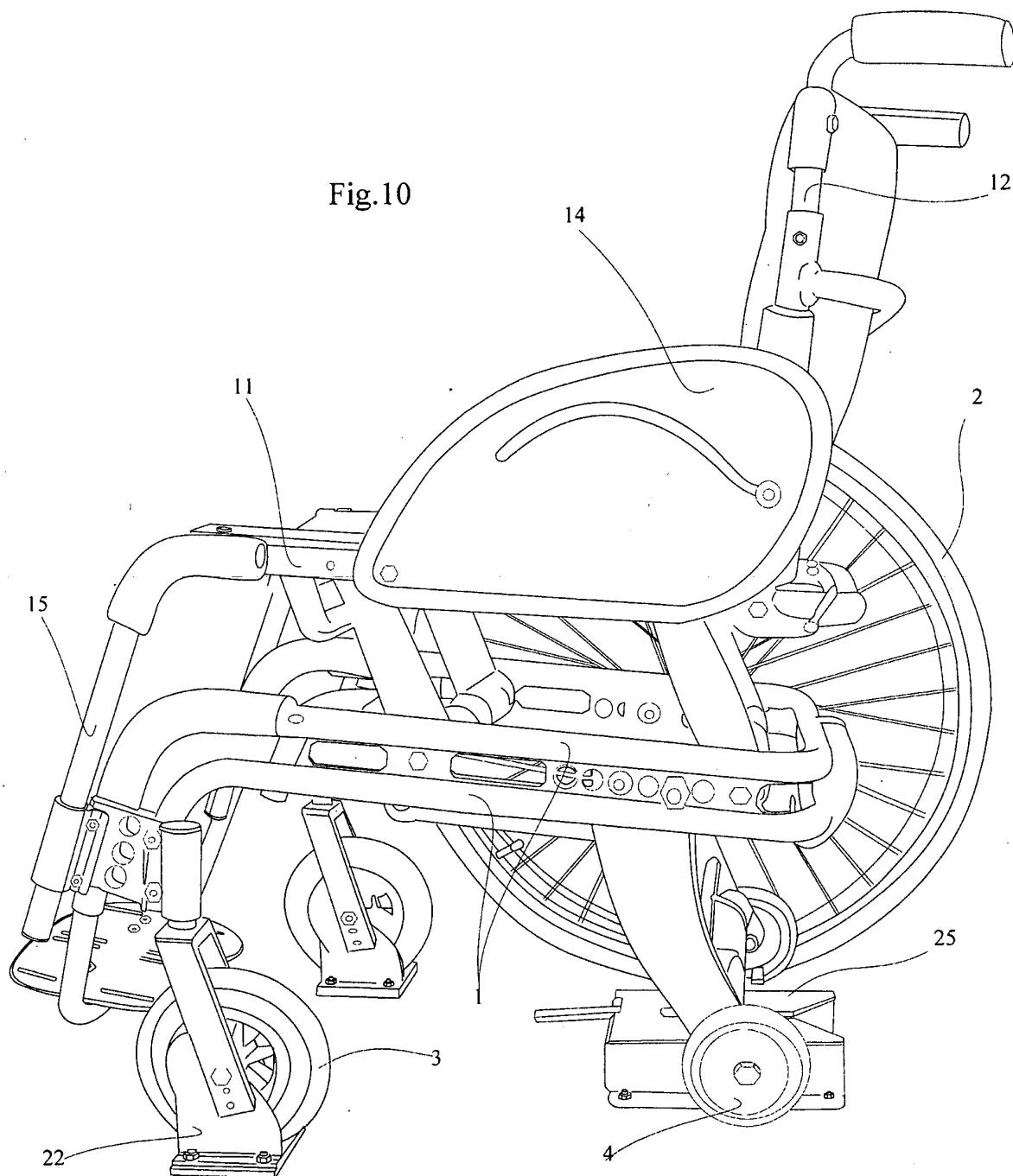


Fig.10





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EUROPEAN SEARCH REPORT

Application Number
EP 03 02 2494

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
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<p>The present search report has been drawn up for all claims</p>			
Place of search	Date of completion of the search		Examiner
THE HAGUE	12 January 2004		Ong, H.D.
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			
T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

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