

KEK

F A S Z I N A T I O N E D E L S T A H L

DEVELOPMENT OF A FOLDABLE TRANSPORT CART FOR CLEANROOMS

Lab / Cleanroom

Structure

1. Background
2. Requirements
3. Technical Description
4. Assembly/ Disassembly
5. Summary/ Advantage



1. Background



The company Dittel Engineering gave us the competition to develop a suitable and foldable transport cart for cleanrooms. The requirements of the cart are to transport measurement instruments and instruments for inspections or qualification measurement in cleanrooms and save space on transportation by car or van. By wrapping (welding) in cleanroom foil, it should be protected against contamination during transport and thus minimize the risk of bringing along particles.

1. Background

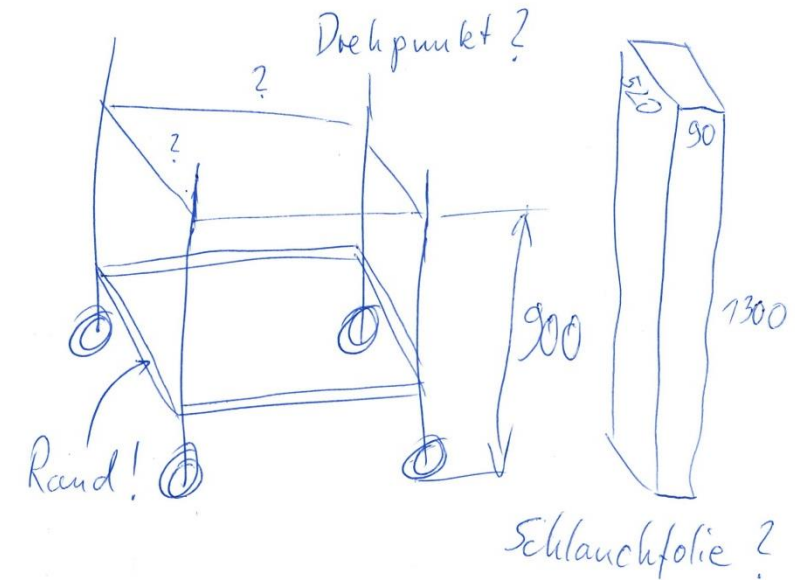
In addition, cables and hoses for instruments should not hang free. Therefore it was necessary to find suitable holders.



The first idea to fold the cart with a round tubing and special milled parts, seemed to be very elaborate. That is why we started design-thinking from scratch.

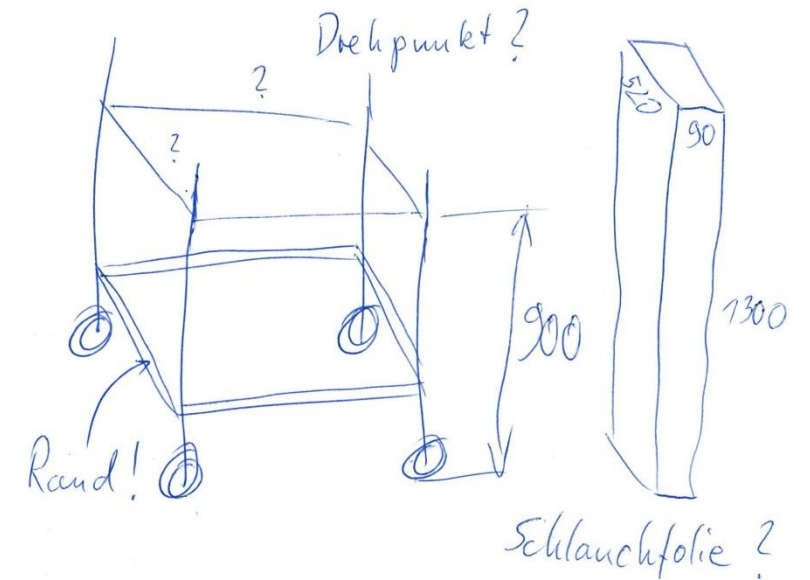
2. Requirements

- Moveable, 4x swivel castors, 2 of them lockable
- Foldable and transportable by one person
- 2x shelves, top shelf in ergonomic height of 900 mm
- Bottom shelf with anti drip moulding against falling of small parts
- Can be welded into cleanroom foil:
 - max. pack size 1300 x 90 x 520 mm, also in folded situation without sharp corners/edges



2. Requirements

- easy cleaning
- Construction suitable for cleanrooms, minimize inaccessible points, hollows completely closed
- Min. 2x holder for cables and hoses
- Robust and durable
- Individualization: concept easily customizable for further applications



3. Technical Description

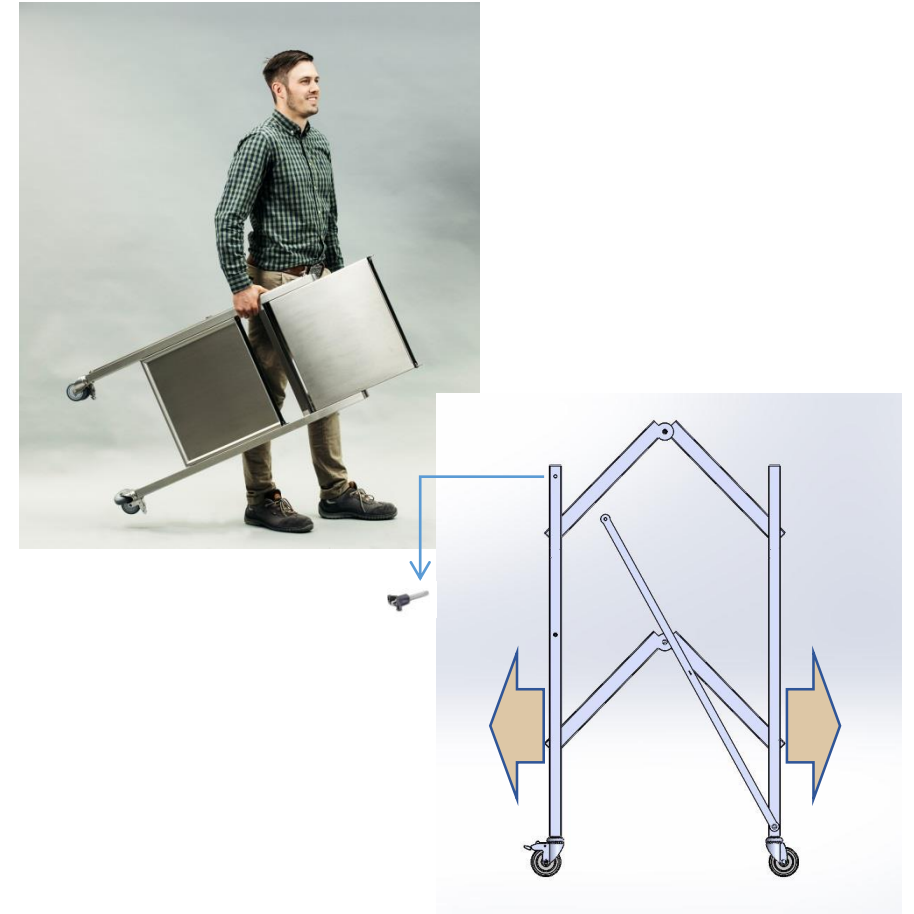
- Assembly/ Disassembly easy for one person without tools
- Ball lock pin for one-hand operation
- Max. shelf load 50 kg, bay load 80 kg, lower shelf with bended edge all round
- 4 swivel castors Ø75mm, 2 of them lockable
- Resistant against chemicals (exception of strong alkalis and fluoride)
- Weight: 17,2 kg



4. Assembly/ Disassembly

Assembly:

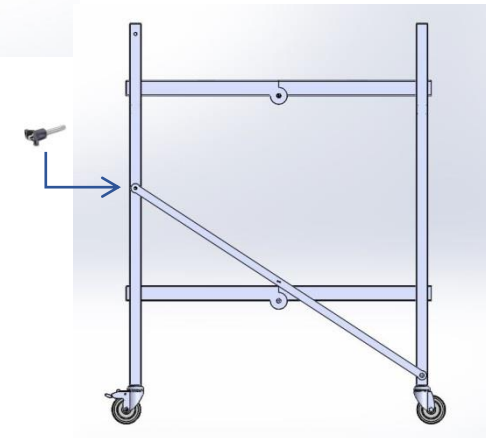
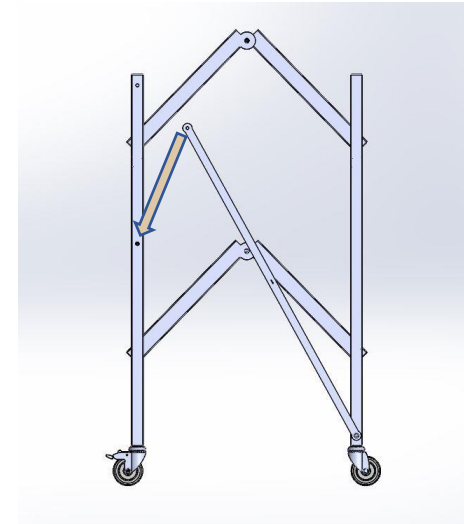
1. Put the folded transport cart on the opposing tubes, where are not stabilisation brace
2. Unlock and remove the ball lock pin
3. Pull both frames apart, the shelves unfolds
4. Caution! Risk of crushing at the gap in the area of the pivot point between the shelves parts



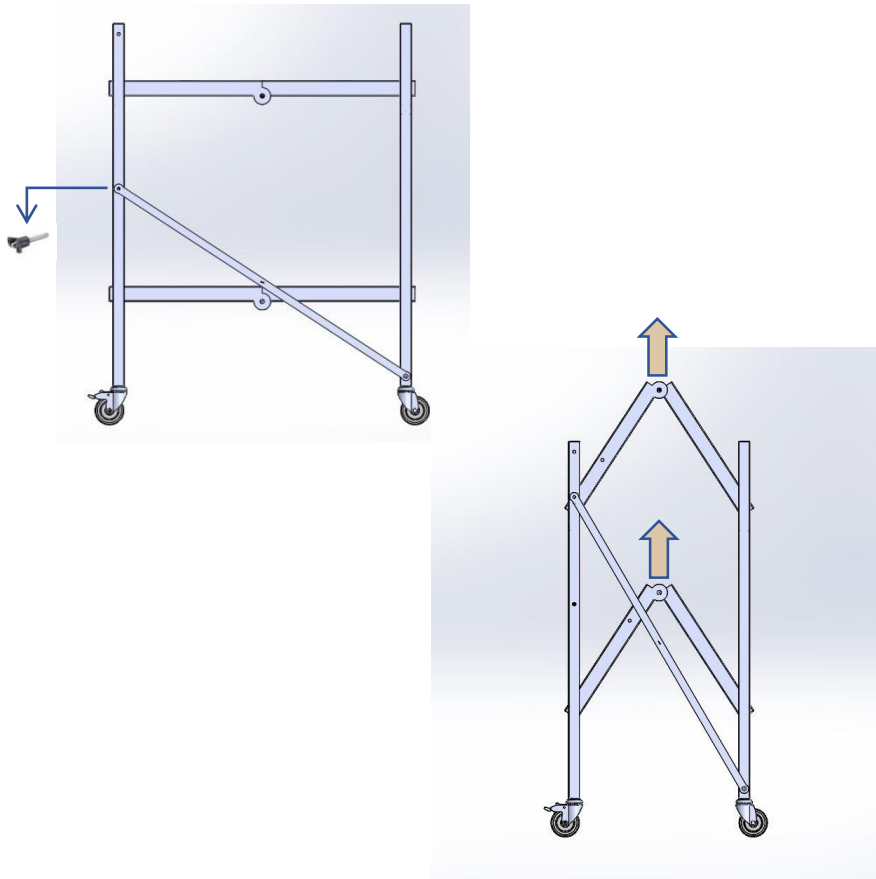
4. Assembly/ Disassembly

Assembly:

5. Move the stabilisation brace on the eyelet over the lower fixing hole
6. Use the ball lock pin for fixing and make sure it is locked
7. Put the transport cart on the castors



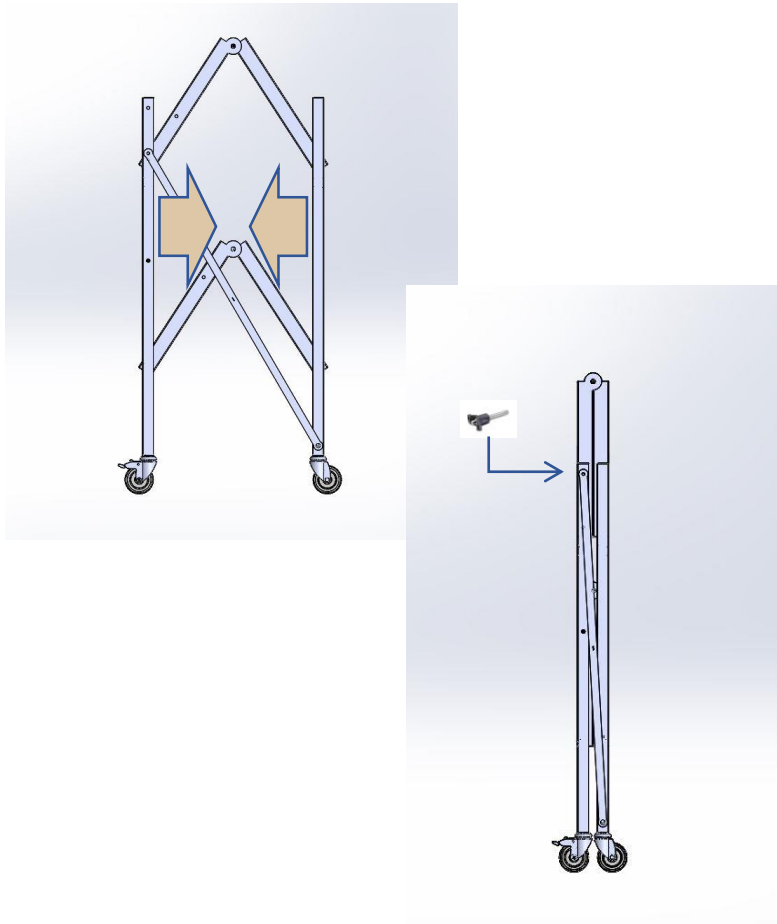
4. Assembly/ Disassembly



Disassembly:

1. Put the folded transport cart on the opposing tubes, where are not stabilisation brace.
2. Unlock and remove the ball lock pin
3. In the area at pivot point pull the shelves upwards
4. Caution! Risk of crushing in the area of lower edge of the shelves part and between the folding shelves and the frame

4. Assembly/ Disassembly



Disassembly:

5. Slide the frame together, that the parts of the shelves fully folded up
6. Move the stabilisation brace on the eyelet over the upper fixing hole
7. Use the ball lock pin for fixing and make sure it is locked



5. Summary / Advantage

- Possible to handle by one person and can be carry without any problem by car or van
- Low expenditure to clean means easy introduce into the cleanroom and better workflow-improvement
- Reduction of transport costs compared to a conventional cleanroom cart
- Happy End-User through participation: From the beginning was it important to fill all need from the customer
- Low risk of contamination, optimized design has already proven in several applications

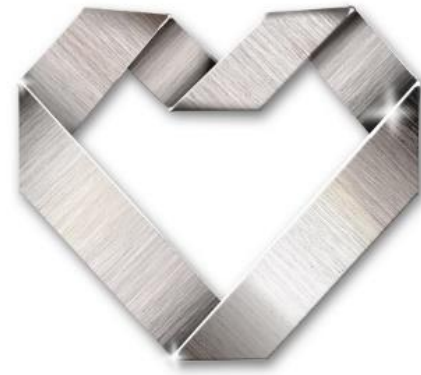


5. Summary / Advantage

- Diverse individualization options:
 - Electrosignature allows to be applied any type of fonts ,logos, scales, etc.
 - Concept can be adapted, by reducing the high of the top shelf, can be reduced the pack size significant
 - It is possible to color and haptic the cart individuel by applying inorganic (glass-ceramic) coatings
- Material Stainless Steel eco-friendly, economic, long-living, recyclable



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Optics
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Elektronics
Laser
**POSSIBLE
APPLICATIONS**
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Analytics



THANK YOU!