

**Project to provide aids for disabled: stop gear for motor vehicles**

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This Degree thesis defines a posture system designed to convey grown-up passengers struck with infantile paralysis by mass-produced motor vehicles. The system, moreover, should make possible the use of the standard wheelchair frames available on the market and make it easier to move into the motor seat with the passenger sitting on.

For a right and exact work it was necessary to cooperate with some experts in the several fields involved in this project: prof. Giorgio De Ferrari (supervisor), prof. Eugenia Monzeglio (tutor), prof. Enrica Fubini (tutor), Mrs. Cristina Corlando (physiotherapist Don Gnocchi Centre, Turin), Mr. Silvio Brambilla (Lear Corporation, Turin -firm manufacturing motor seats-).

Chapter 1 -**USERS**- It determines and describes the set of people getting in touch with the stop gear.

- **USERS:** people struck with infantile paralysis.
- **USERS' ASSISTANT:** people who actually work the stop gear in its employment because of users' movement problems.
- **MANAGEMENT:** people working on the product during the preliminary stages to its employment.
- **ENVIRONMENT:** people availing themselves of the product with reference to the environment (ecological aspects) and/or its meaningful qualities.

Chapter 2 -**USERS' REQUIREMENTS**- It lists the requirements the posture system should fulfill.

the 17 requirements are summarized in some aims:

1. THE STOP GEAR SHOULD MAKE POSSIBLE THE USERS' TRANSPORT BY MASS-PRODUCED MOTOR VEHICLES.
2. IT SHOULD GIVE THE USER A RIGHT POSITION.
3. IT SHOULD MAKE POSSIBLE THE USER'S MOVE TOWARDS THE VEHICLE.
4. IT SHOULD FACILITATE THE VEHICLE ACCESSIBILITY.

Chapter 3 -**REQUIRED PERFORMANCES**- It gathers some data which specify requirements and make them practicable.

This information was got thanks to a deeper study organized in 7 focuses:

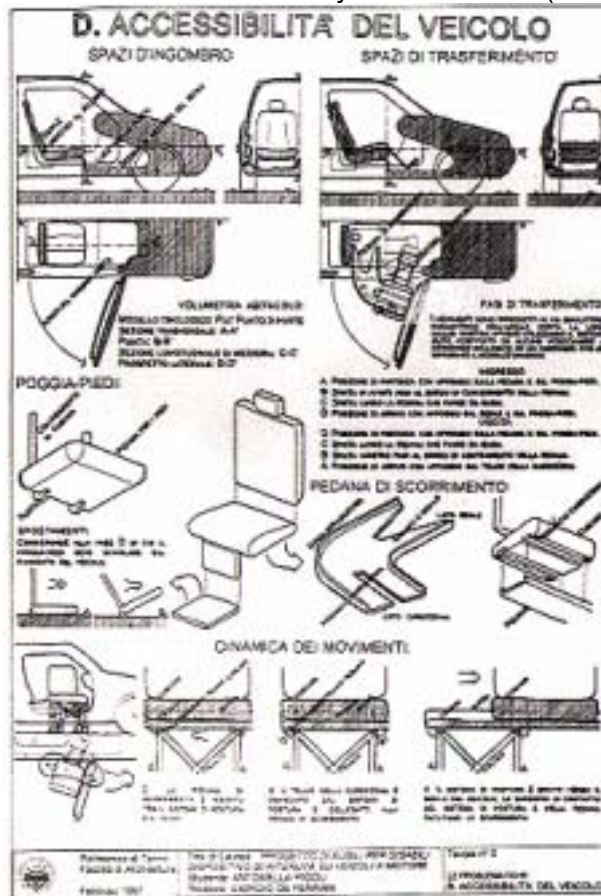
1. POSTURE.
2. ANTHROPOMETRIC ANALYSIS.
3. VEHICLE.

4. THE AID DESIGN FOR THE DISABLED.
5. AID MANUFACTURING.
6. THE AID MARKET.
7. THE PATENTS FOR MOTOR SEATS.

Chapter 4 -**SUPPLIED PERFORMANCES**- It lists the elements fulfilling all requirements in a satisfactory way.

Six aspects have been dealt with means of layout tables.

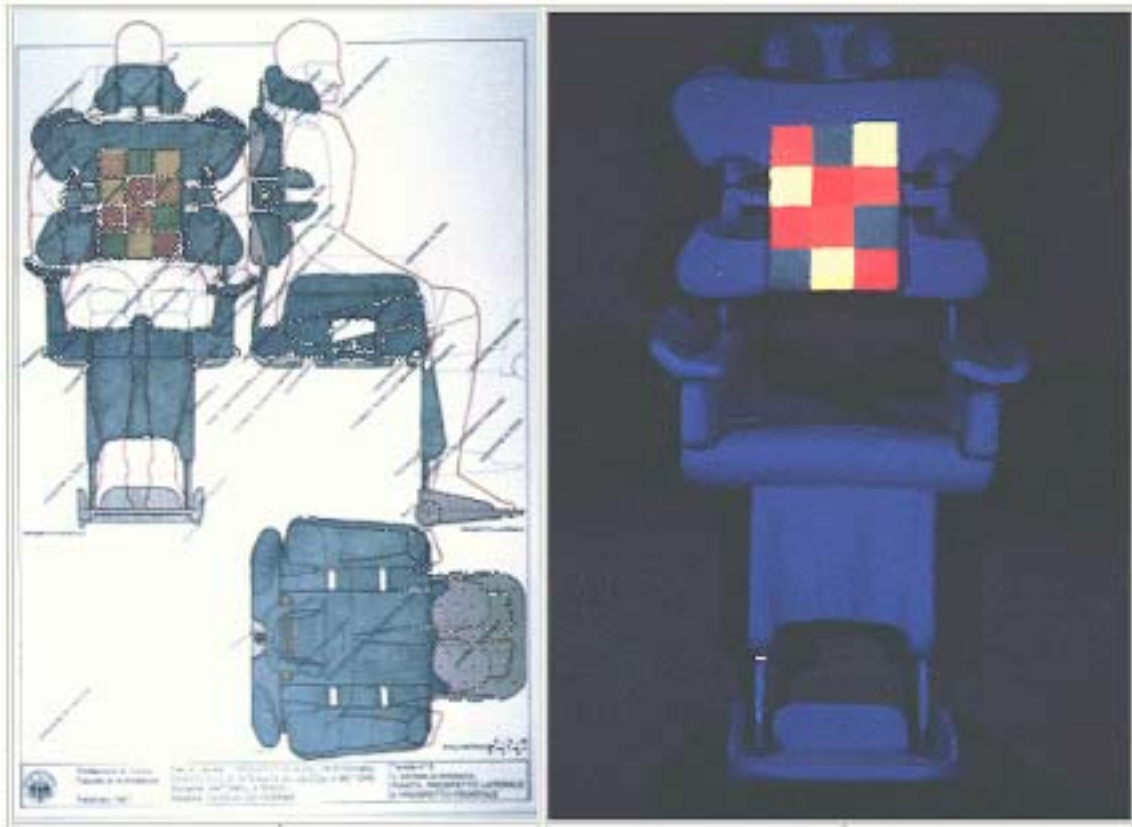
- **POSTURE COMPONENTS AND SIZE DATA:** they are summarised in the standard pattern (Table n°1).
- **PADDING:** it studies how the body weight is distributed through the Sensing Force Array (Table n°3) and the proper supporting surface (Table n°2).
- **CONNECTION WITH THE WHEELCHAIR:** the stop gear has a connection fitting the main basic frames available on the market (Table n°4).
- **CONNECTION WITH THE MOTOR SEAT:** the stop gear is supplied with a connection secured to the vehicle without any modifications (Table n°4).



Pict.1

- **VEHICLE ACCESSIBILITY:** it considers the way the stop gear lets the user get on and off the vehicle by means of a sloping footboard (Table n°5) [Pict.1]. The Elite System checks movements (Table n°6).

- **ADJUSTMENTS AND SLOPES:** the need to move some posture elements made necessary to study the proper adjustment (Table n°7).



pict.2

pict.3

Chapter 5 -**THE STOP GEAR**- Thanks to the conclusions drawn in the previous chapter, it was possible to suggest a project.

- **POSTURE SYSTEM:** It is presented through plan, side and front view (Table n°8) [FIG.2], side section (Table n°9) and rendering (Table n°13) [Pict.3].
- **THE INTERFACE WITH THE BASIC FRAME:** the stop gear is connected with the basic frame helping the accessibility into the vehicle (Table n°10). It uses a coupler (Table n°10) which makes easy the connection with the frames available on the market.
- **THE INTERFACE WITH THE MOTOR SEAT:** the stop gear is connected with the motor seat of the Fiat Punto (Table n°11). To get an easier vehicle accessibility it was necessary to project a sloping footboard (Table n°12); moreover, a coupler was planned to clasp the stop gear without modifying the vehicle.